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A REVIEW OF THE GREEN ECONOMY IN CAPE TOWN: LOCAL POLICY IN THE LIGHT OF INTERNATIONAL APPROACHES

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Declaration

I am presenting this dissertation in partial fulfilment of the requirements for the degree of Master of Philosophy specialising in Urban Infrastructure Design and Management in the Faculty of Engineering.

I know the meaning of plagiarism and declare that all the work in the document, save for that which is properly acknowledged, is my own.

Signed: Marko Petrik Signed by candidate

Date: 15 February 2016

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Abstract

The industrial economy of the last 100 years has resulted in significant externalities, chief of which has been anthropogenic climate change caused by the release of greenhouse gasses into the atmosphere. The green economy is an approach to economic activity that has been developed in an effort to mitigate against this and attempt to shift the world economy onto a more sustainable course. South Africa has a particularly carbon-intense economy, and as such bears a considerable burden to follow this shift. Cape Town, following the lead of national government, has begun to respond to climate change and has made steps to adopt the green economy. However, much of the literature and theory developed around the green economy has been produced by developed nations, which may render it problematic to be adopted by a city in a developing nation, such as Cape Town. This dissertation begins with a brief description of the background and definition of the green economy. Based on a reading of the international literature, it then uses an analytical overview of conceptual descriptions of the green economy to develop a Transition Framework as a tool for evaluation and comparison. The Transition Framework is then applied to the green economy in the city of Cape Town as a case study.

While the City of Cape Town quite overtly applies international conceptions of the green economy to its formulation, it was found that there were some significant local deviations: political parties play an important role in leading and shaping the local green economy; there is a particular need to balance green economy interventions against the preservation of municipal income from tax; the city's spatial-geographic character plays an important role in strategy and planning; and the primary aim of the local green economy is to increase economic growth and produce employment opportunities, in order to ensure social and political stability.

This study highlighted the fact that international conceptions of the green economy do have a significant amount of flexibility towards local conditions, this may in some cases result in a drift away from some of its stated aims (reducing greenhouse gasses, for example) towards addressing the most pressing local issues. This may potentially render its goals unachieved.

KEY WORDS:
Green economy; City of Cape Town; political regimes; transition; Transition Framework; climate change; externalities

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List of Terms and Abbreviations

AFRICEGE	African Centre for a Green Economy
ANC	African National Congress
ASGISA	Accelerated and Shared Growth Initiative for South Africa
CSP	Concentrated Solar Power
CoCT	City of Cape Town—the metropolitan municipality ('metro') executing the functions of the local government for Cape Town
DA	Democratic Alliance
ECCS	Energy and Climate Change Strategy
EGS	Economic Growth Strategy
EIU	Economist's Intelligence Unit
EPRSA	Environmental Performance Review for South Africa
EPWP	Extended Public Works Programme
GHG	Greenhouse Gas
ICCWBO	International Chamber of Commerce
ICLEI	International Council for Local Environmental Initiatives
IDP	Integrated Development Plan
IPAP	Industrial Policy Action Plan
IRT	Integrated Rapid Transport
ILO	International Labour Organization
IMEP	Integrated Metropolitan Environmental Policy
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for the Conservation of Nature and Natural Resources
IWEX	Integrated Waste Exchange
Metro	metropolitan municipality or local government for a city and its extended urban area
MLP	Multi-Level Perspective theory of transition
mtpa	Metric tonnes per annum
NCCRP	National Climate Change Response Policy

NDP	National Development Plan
NEDLAC	National Economic Development and Labour Council
NGP	New Growth Path
NIPF	National Industrial Policy Framework
NOAA	National Oceanic & Atmospheric Administration
NSSD1	National Strategy for Sustainable Development 2011-2014
OECD	Organisation for Economic Co-operation and Development
PSG	Provincial Strategic Goal
ppmv	parts per million by volume
PWP	Public Works Programme
REIPPP	Renewable Energy Independent Power Producer Procurement Programme
SAGEM	South African Green Economy Modelling Report
SACN	South African Cities Network
SAGOV DEA	Republic of South Africa: Dept. of Environmental Affairs
SAGOV DEAT	Republic of South Africa: Dept. of Environment Affairs & Tourism
SAGOV DED	Republic of South Africa: Dept. of Economic Development
SAGOV DST	Republic of South Africa: Dept. of Science and Technology
SAGOV DTI	Republic of South Africa: Dept. of Trade & Industry
SAGOV NPC	Republic of South Africa: National Planning Commission
SAIIA	South African Institute of International Affairs
SALGA	South African Local Government Association
SDS	Social Development Strategy
SEA	Sustainable Energy Africa
TEEB	The Economics of Ecosystems and Biodiversity
tCO_2	tonnes of carbon dioxide
tCO_2e	tonnes of equivalent carbon dioxide
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development

UNDESA	United Nations Dept. Economic and Social Affairs, Division for Sustainable Development
UNDPI	United Nations Dept. of Public Information
UNEP	United Nations Environment Programme
UN-Habitat	United Nations Human Settlements Programme
UN-OHRLLS	Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States
WCED	World Commission on Environment and Development
WCG	Western Cape Provincial Government
WISP	Western Cape Industrial Symbiosis Programme
WWF	World Wide Fund for Nature

CHAPTER 1: INTRODUCTION

1.1 Statement of problem

- Internationally, as the evidence and consensus for anthropogenic climate change has accumulated, there has been a growing recognition that at the heart of this crisis is humanity's economic activity. That is, the philosophies, systems, inputs, processes and outputs of what is termed 'economic activity' have vast consequences for the very survival of the planet and humanity itself.

- This growing recognition has in turn influenced both countries and international bodies to look at ways to begin addressing ecological destruction and climate change, and to steward the resources of the earth more responsibly. One of the key concepts arising out of this has been a call to transition towards the so-called "Green Economy." The green economy is an economic form subject to various definitions attempting to balance the three spheres of economy, environment, and society in a way that is energy and resource efficient, low carbon, sustainable in the long term, not harmful to the environment, and socially just.

- In many regards, the green economy is a response to a series of looming environmental issues, particularly climate change, generated by the conventional economy and patterns of material consumption. It has largely been promulgated via international bodies like the World Bank, UN-Habitat and UNEP. South Africa quite explicitly bases its articulations of the green economy on these bodies' conceptions.

- In South Africa, the various levels of government has acknowledged the perils of climate change and have begun to respond to the threat through various policy interventions, including those relating to the green economy. The Western Cape provincial government and the City of Cape Town local government have embraced the green economy as described by their various policy documents including: *OneCape2040*, the *Green is Smart Green Economy Strategy Framework*, and the *City Development Strategy*.

- This is problematic: Cape Town, and South Africa more generally, face economic, social, environmental and political challenges that deviate significantly from the countries in which the green economy was initially articulated. While local green economic interventions and projects may successfully complete their stated objectives, they may fail to actually address the major and pressing concerns in the country. This may have the result of de-legitimising the green economy and rendering it politically unacceptable, if it does not meet at least some of the pressing socio-economic concerns.

- It is expected that although local and provincial governments may follow an internationally acceptable definition of the green economy, it is likely that in actuality policy may show significant drift towards a more socially and economically-focused green economy.

1.2 Contribution

The contribution of this dissertation is an investigation into the Cape Town green economy, particularly the concepts and ideas that underpin it. The background and origins of the green

economy are briefly discussed, before moving onto a description of the various ways in which the term 'green economy' is defined in the international literature. A reading of the literature is then used to produce an analytic overview of the high-level conceptual descriptions of the green economy transition, resulting in a tool for evaluation and comparison: the Transition Framework.

The dissertation then moves onto a case study of the Cape Town green economy. Its origins and definitions are laid out, as well as the strategies, policies, plans and related local literature pertaining to it. The Transition Framework is then applied to the Cape Town green economic space, in order to produce an understanding of how the local conceptions of the green economy diverge from the international literature.

The dissertation then segues into a broad discussion of the relevance of the green economy as a means of producing sustainable economic activity. A summary of the important points of the dissertation follows, before concluding.

1.3 Map of dissertation

The dissertation is structured according to the following logic:

Chapter 1: Introductory matters

- The research question and approach are laid out.

Chapter 2: Methodology

- Describes the research approach taken for this study. The methodology chapter appears earlier in this dissertation than is the norm, the rationale behind this is due to the special role that the literature review plays within this study, explained below.

Chapter 3: critical review of international literature

- While generally a literature review is used to identify 'gaps' in academic literature that would be ripe for exploration, in this present study, the literature review will take the form of a critical overview of green economy conceptions.
- This chapter will use the international literature to: describe the genesis of the green economy, summarise of the various ways in which the term is defined, and create a Transition Framework to be used later in the dissertation to analyse the Cape Town green economy.
- The Transition Framework is essentially a high-level summary of the conceptual paradigms that underpin the green economic transition.
- Literature used includes international policy and position papers, as well as academic articles.

Chapter 4: review of the green economy in relation to Cape Town

- This chapter represents a review of the Cape Town green economy environment.
- It will begin with an examination of the background to the green economy, describing the demographic and economic characteristics of the city, before turning to look at how green economic theory is defined in the city

- An investigation of government strategy, policy, and projects relating to the green economy follows. This will attempt to discover whether there has been significant reorientation from the international consensus.
- The Transition Framework developed in chapter 3 will then be applied to the Cape Town green economy situation as an analytical tool.

Chapter 5: Critical Discussion

- This chapter presents an overview of the common critiques against the green economy, in order to highlight some of the challenges facing its adoption.

Chapter 6: Summary and Conclusion

- Chapter 6 is composed of a summary of the main arguments of the dissertation, and the conclusion.

References

Appendices

1.4 Research approach

This research report is a desktop-based review of academic literature, policy documents, journals, newspapers, websites and the like, as well as interviews with relevant parties. This is a qualitative study of the visions and goals of the City of Cape Town's green economy push – a series of activities of which many are still in their conceptual phase or infancy. Thus this report does not include quantitative data research. It will compare qualitative concepts, and project their expected fruit (or lack thereof) into the future.

1.5 Scope and delimitations

As noted above, this report's scope encompasses a qualitative study of the green and sustainable economic concepts mooted by various bodies. Thus it will be limited to a qualitative review, and does not look at quantitative data. It presents an overview of the green economy policy environment of Cape Town, this is not intended to be in-depth or all-encompassing. It does not include analysis of projects, programmes or other sorts of green economy implementation. A list of some of these can however be seen in Appendix B.

1.6 Intended Audience

As a qualitative overview of the green economy space both internationally and in Cape Town, it is expected that this dissertation would be useful to newcomers to the field, or the specifics of it in Cape Town. It would also be of use to those wishing to track the shifts that green economic theory undergoes in developing cities.

CHAPTER 2: METHODOLOGY

2.1 Introduction

2.1.1 Approach

This research paper is a qualitative desktop study using published information available in government documents, journals, libraries and the internet. An expert in the field was approached for commentary.

The approach has been to examine the international literature to describe the background and genesis of the green economy, and the way in which different authorities define it. A reading of the literature was used to produce a Transition Framework: an overview of the concepts underlying the green economy.

These same steps were followed in a case study of Cape Town. Firstly, a background to the green economy in the city was given, followed by the way in which the term is defined. This was then followed by an overview of relevant policy, strategy and related government documentation. The Transition Framework was then applied to the local example, enabling differences and divergences between international and Cape Town-specific conceptions of the green economy to become evident.

This is followed by a discussion on the applicability and relevance of the green economy as a valid approach to sustainable economics, and as a usable economic theory for the developing world. The dissertation ends with a summary of the relevant information and a conclusion.

2.1.2 Rationale for selecting Cape Town as a case study

Cape Town was selected as a case study for a number of reasons. Firstly, much of the literature relating to urban responses to climate change and the green economy is produced in industrialised, developed and predominantly Western nations, while there is comparatively less information for cities in developing nations. Cape Town presents a particularly interesting example of a developing nation city engaging with the concept of the green economy, because:

- It is sited within a developing nation which is battling a host of social, environmental and economic ills that usually are less of an issue in the West.
- The conditions of South Africa make job-creation and growth a necessity of any plan attempting to influence the trajectory of the economy.
- It is part of an economy that is particularly carbon intensive.
- The green economy is presented as a way to both mitigate this carbon-intensive economy, while addressing the developmental goal of reducing high unemployment.
- The green economy is part of the national agenda, whereas this is not the case in many developing nations.
- The City government has well-developed policy-producing infrastructure, and is home to many academic institutes producing research on the green economy.
- Cape Town attracts many organisations and businesses which are allied to the green economy space.

2.2 Types of information to be collected

2.2.1 Literature

The following resources were consulted: policy documents, academic papers and journals, websites, books, government communications, national provincial and municipal strategy documents, and other publicly available documents and recordings. These documents and resources were used to compile the information needed to answer the research questions.

2.2.2 Interview

A minor part of the research conducted in this report was an informal interview conducted with an expert in the field, as a preliminary step to beginning the dissertation. He was approached for interview based on his knowledge regarding sustainability, economics, the government, urban planning, and related fields. His input was needed as a fact-gathering exercise, to reveal case studies, policy, theory and other literature, as well as to bring to light the various projects and planning relating to the topic.

The interview took the form of a face-to-face discussion, and was informal, unscripted, open-ended and preliminary in nature. The Interview Guide (below) served as a guide for discussion, but the discussion was not be limited to these topics.

Sound recordings were taken, with the permission of the interviewee.

Interviewee has been correctly cited.

Personal or social information was not solicited, merely information that the subject in his position was entitled to reveal.

Please see Appendix A for more information on the interview.

CHAPTER 3: CRITICAL REVIEW OF INTERNATIONAL LITERATURE

3.1 Chapter Introduction

The following chapter reviews the international literature on the green economy. The 'Background' section lays out the genesis of the green economy. This section describes how the technological transition engendered by the Industrial and Green Revolutions led to huge productivity gains and consumption growth. It then describes how this economic system generated enormous negative externalities, and how these resulted in a series of escalating social and environmental problems. The Background section ends with a description of how the green economy has come to be presented as a solution to addressing these issues.

The second section in this chapter, 'Definitions', describes how various authorities in the literature define the term 'green economy', why there is a fair amount of ambiguity in definition, and why this might be useful. It also includes a short description of the emphases that various dialogues on the green economy tend to take, as described by Death (2014).

The third section, 'Transition Framework', presents a framework developed out of an overview of the conceptual underpinnings of the green economy literature. This Framework is designed to allow the user to evaluate real-world green economy activities in light of the more 'abstract' body of international literature, and identify differences.

3.2 Background

3.2.1 The consequences of the Industrial Revolution

Before the 1800s, humanity was essentially caught in a Malthusian trap: advances in the technology of the day (for example, the invention of the ox-drawn plough) lead to productivity increases (more land under tillage and thus more crops), which themselves led to improvements in human living livelihoods (surpluses could be exchanged for other goods). However, as populations grew, these living standards would be quickly eroded, leaving humanity trapped at the same standard of living it was at before the technological advance. The advent of the Industrial Revolution (and carbon-based energy forms) from the 1700s onwards changed all of this. Advances in machinery and the development of the production-line factory caused a massive improvement in what a single unit of human labour was able to produce – production became decoupled from labour, meaning more could be produced by fewer. At the same time, the increasing use of carbon-based energy forms (coal and oil) led to an amazing increase in the energy able to power the new machines: the energy potential of a single barrel of oil is equivalent to an adult human working a 40 hour week for 12 years (Alfredsson 2012:10). The so-called Green Revolution of the 1950s decoupled productivity from the size of arable land, resulting in massive productivity gains in agriculture, as new pesticides, herbicides and fertilizers enabled farmers to output on a multiplied scale (Dobbs et al 2012:1). Still more recently, the microchip revolution has further sped this productivity – no longer limited by the speed of human operators, machines are now producing goods on a range and scale never imagined. Massive technological advances over the last few decades have led to further revolutions in medical science, material science, plastics, chemical engineering, biotechnology, and more recently, nanotechnology.

Increased productivity has meant that broadly, the price and availability of goods has radically changed since 1700. Household furnishings and basic necessities like clothes are available in quantities and at a price that was unheard of 250 years ago (Bryson 2010:90-91, 229). Human beings have been able to stage a 'great escape' from extreme deprivation in the last 250 years. An offshoot of the Industrial Revolution was the migration by country people towards the industrial conurbations and their huge factories. The awful conditions of these early industrial cities surprisingly led to advances in medicine—particularly the understanding of the link between infectious diseases and sanitation (Bryson 2010:508-520). Over the years further advances led to amazing gains in human health, and in the last 60 years have made significant gains in human health: since 1950, average life expectancy has soared from 47 to 69 years, while infant mortality has decreased from 214 to 59 per thousand live births (Whitmee et al 2015:2).

Decoupling productivity from labour meant rises in income for some, as well as an increase in the leisure time needed to spend their larger incomes. A middle class arose, demanding ever more products, which the new industries rushed to cater to. In more recent decades, things have sped up even more. Between 1980 and 2009, the global middle class expanded by roughly 700 million people to 1.8 billion, and is expected to grow to 5 billion by 2030. In China and India, real per capita incomes are doubling ten times faster than they were during the Industrial Revolution, at a scale two hundred-fold larger (Dobbs et al 2012: 2). The global car fleet is expected to double to 1.7 billion cars by 2030, while China's per capita meat consumption is expected to increase by 40% during that time (Dobbs et al 2011:5). The world economy has quadrupled in scale over the last 25 years (UNEP 2011a:20).

3.2.2 Negative externalities generated by conventional industrial and economic systems

Unfortunately, there is a cost involved in this equation. As this mighty industrial engine has expanded to meet the increasingly voracious appetites of a burgeoning society, it has begun to outstrip the Earth's ability to regenerate the resource inputs the economy requires, and to absorb the wastes that it excretes.

3.2.2.1 Peak carbon

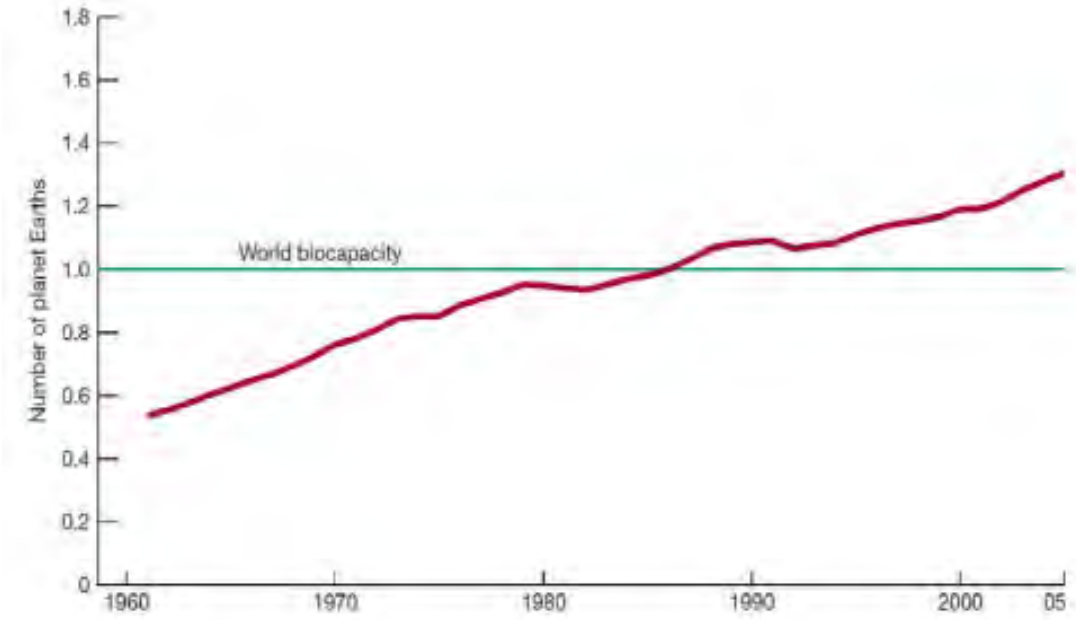
According to Stern & Kander (2012 in Alfredsson 2012:11) economies with abundant energy sources exhibit the behaviour of modern growth regimes, but when these become constrained, output growth is limited, resulting in a low income steady state. Considering the link between climate change and carbon-based fuel usage, there is a growing move away from carbon-based economies. At the same time, market volatility and unreliability of carbon fuel sources has started to make fossil fuels seem less attractive. This leaves us with the difficult task of finding a different source of energy.

3.2.2.2 Biodiversity and habitat loss

Humans have converted around a third of habitable (ice and desert-free) land on the earth to agricultural use. We use roughly half of all accessible freshwater every year, and have dammed more than 60% of the world's rivers. We have cut down 2.3 million km^2 of forest since 2000, and currently are harvesting 90% of (monitored) fisheries at levels at or beyond their sustainable limits. We are destroying species at 100 times the rate at which the fossil record shows as normal, and there is indication that since 1970 vertebrate species on average have had their population sizes cut in half (Whitmee et al 2015:3-4). The WHO's Millennium Ecosystem Assessment estimates that of the

indispensable ecosystem services (such as water and air purification, climate regulation, provisioning of food and goods, nutrient cycling) it examined, 60% are being used unsustainably or degraded, resulting in major impacts on human wellbeing, aside from general environmental health. Additionally, because the causal links between humans and the environment are complex and often not well understood, there is an additional element of unpredictability in the mix, meaning that we are often unable to predict ahead of time exactly what the final result will be. There is increasing evidence that changes to the ecosystem maybe follow a non-linear scale, raising the spectre of catastrophic, irreversible change. (Corvalan et al 2005: iii, 1-2, 7). Sixty percent of major ecosystem goods and services have been degraded or used unsustainably (UNEP 2011a:20).

Figure 1: Humanity's Ecological Footprint 1961-2005 (WWF 2008 in Rode 2010:4)

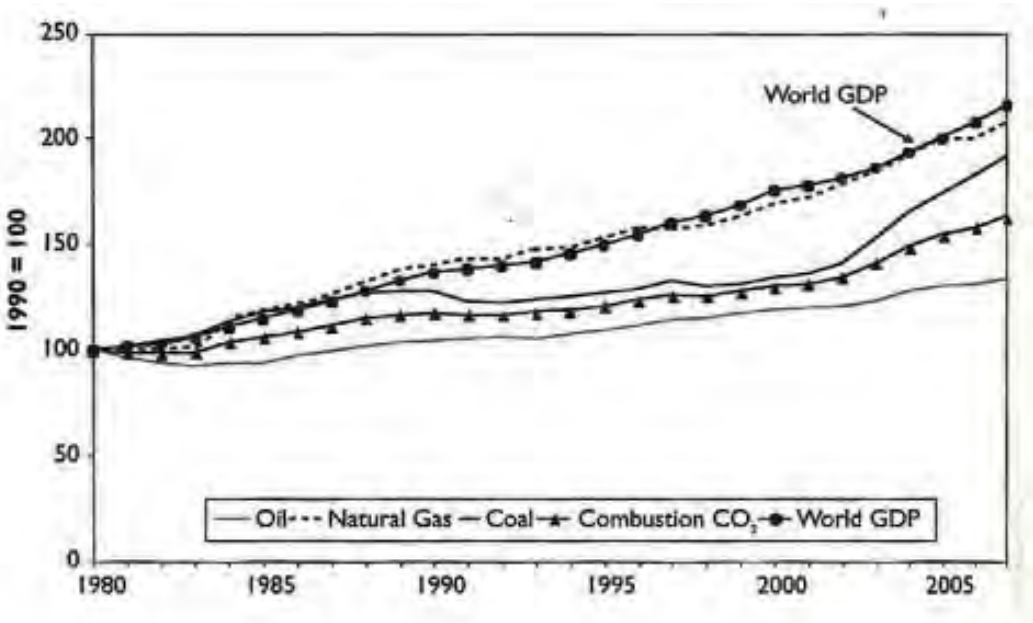


There is in fact evidence that plant and animal species are moving onto new ranges as climate conditions change (Monzón, Moyer-Horner, Baron Palamar 2011). However, most plant species, and most small animals and especially marine organisms will not be able to shift their geographic ranges under the expected rates of climate change projected by some future scenarios, leading to increasing species extinctions (IPCC 2014:13). With direct relation to the economy, this starts meaning that agricultural resource inputs (farming activities, timber, livestock, grain) become more prone to risk. Furthermore, environmental degradation and diversity loss (via pollution or habitat destruction) removes potential new resources from economic exploitation. Considering that habitats such as rainforests have acted as pharmaceutical cornucopias for decades, this indicates a substantial loss for human thriving – for example, 42% of anti-cancer drugs in use today are made from naturally occurring substances (Dobbs et al 2011: 7), while up to 50% of the $640 billion world pharmaceutical market is obtained from natural genetic resources (Bishop et al 2010:4).

3.2.2.3 Jevon's Paradox

Rode (2010:6) shows that despite efficiency gains in production technology, there has been little decoupling between economic output and resource consumption. Productivity increases simply lead to more resource consumption, leading to what is known as the "Jevon's Paradox" – that efficiency improvements, rather than leading to a decrease in carbon overall, actually cause actors to undertake more economic activity – perversely eroding any reductions that were made in emissions (Kosoy et al 2012:75).

Figure 2: Economic Output and Resource Consumption: no absolute and little relative decoupling (UK-SDC 2009 in Rode 2010:6).



3.2.2.4 Harmful wastes

Many of the wastes created by the economy cannot actually be absorbed by natural sinks, and will simply accumulate and find their way into the food chain, causing increasing harm as they do. For example, the pesticides and herbicides used to boost food production are showing up in human urine and breast milk (Weldon, Barr, Trujillo, Bradman, Holland, Eskenazi 2011).These chemicals, designed to kill natural life such as insect pests and weeds, are harmful to human and animal life. Roundup, for example, a popular herbicide, has been shown to effect the endocrine systems of animals causing feminisation and sterility in males, as well as death (WWF 2010:16, 22).

3.2.2.5 Climate change

More worryingly, recent years have seen the rise of the spectre of climate change. The earth's climate is determined by a variety of factors, a key issue being how much infrared light the atmosphere is able to retain. Various factors throughout the history of the planet have had an effect on this, including the type of solar radiation, the albedo of the planetary surface, and biological, and geophysical processes. These are usually long term processes, and indications are that in the last 10 000 years we have had a period of relative stability. However, since the mid-20th century, human based activity has produced an enormous amount of the so-called 'greenhouse gases' (including carbon dioxide and methane), which, when they enter the atmosphere, trap ever larger amounts of solar radiation, heating the planet. The scientific consensus is that a safe level of carbon dioxide in

the atmosphere should be about 350 ppm, but as of June 2015 it is 402.8 ppm (National Oceanic & Atmospheric Administration 2015), and is expected to only stabilize at 450 ppm (Blowfield 2013:18). Since the beginning of the Industrial Revolution, but with the last 40 years being a major contributor, carbon dioxide, methane and nitrous oxide emissions have risen to levels not seen in 800 000 years (IPCC 2014:4; Whitmee et al 2015:4). That the climate is warming is unambiguous, with the period from 1983 to 2012 being the warmest 30 year period in the last 1400 years, (IPCC 2014:2) and a rise of from 2 to 4.8° Celsius in global average temperature being expected (Blowfield 2013:18; IPCC 2014:10) with major impacts on climate systems such as extreme precipitation and discharge, droughts, heat waves, storm events and sea level rise (IPCC 2014:8). The presence of elevated levels of greenhouse gasses is widely associated with impacts on water resources, crop yields, ocean acidification, and the migration patterns, populations and interactions of animals (IPCC 2014:7).

The enormous changes that mankind has wrought upon the planet as a result of the advances of the Industrial Revolution have led scientists to label our current era the Anthropocene. According to science, the environment of the planet has enjoyed relative stability for the last 10 000 years, enabling the thriving of humanity. Now the activity of mankind is threatening this environmental stability (Rockström, Steffen, Noone, Persson, Chapin III, Lambin, Lenton, Scheffer, Folke, Schellnhuber, Nykvist, de Wit, Hughes, van der Leeuw, Rodhe, Sörlin, Snyder, Costanza, Svedin, Falkenmark, Karlberg, Corell, Fabry, Hansen, Walker, Liverman, Richardson, Crutzen, Foley 2009: 472). Rockström et al (2009) suggest the existence of planetary boundaries, a safe space for the thriving of humanity and the environment. Moving beyond these thresholds may result in the environment responding in unpredictable and non-linear ways. The authors suggest the following boundaries have been or will soon be exceeded:

Table 1: Proposed planetary boundaries and their current statuses (Rockström et al. 2009:473)

Earth system parameter	Proposed boundary	Current status (2009)	Effect on:
Atmospheric carbon dioxide concentration	350 parts per million by volume (ppmv)	387 ppmv	Climate change
Amount of Nitrogen removed from the atmosphere for human use	35 million tonnes per annum (mtpa)	121 mtpa	Nitrogen cycle
Extinction rate	10 (number of species per million species per year)	>100	Biodiversity loss
Global mean saturation state of aragonite in surface sea water	2.75	2.9	Ocean acidification

That is, the increased carbon entering the atmosphere as a result of human economic and agricultural activity has begun to alter the climate at rates which are wholly unnatural. This has dire effects for environmental and human thriving. Weather patterns become more unpredictable and extreme, leading to droughts, floods and changed patterns of rainfall. Local climactic conditions may change irreversibly, for example making formerly well-watered areas drier. Water-scarce regions, like the Western Cape, are particularly vulnerable to climate change (CoCT 2013a:43).

The Stern Review describes climate change as the *"greatest and widest-ranging market failure ever seen"* (Stern 2006: vi). Essentially 'market failure' refers to a situation where economic efficiency in the allocation of goods or services is not achieved – that is, the allocation could have been done in a way that made one economic actor better-off without making anyone else worse-off. In the case of climate change, market failure refers to a situation where the greenhouse gasses that damage the environment are produced as a result of industrial activity – but are not incorporated into the market price of the activity (which would include labour and capital costs, for example), making them 'external' to the operations of the market. Because the market does not take into account these 'externality costs' (for example, the expense of removing the pollution, the harm it may cause to the environment) the market will over-indulge in the activity that produces them. The environment and society-at-large ends up bearing this cost, often without benefitting from the economic activity that produced them in the first place. Market failure in this sense can also refer to a situation where a resource is not valued correctly. That is, a common property resource (a resource to which access is uncontrolled or only controlled to a limited extent) like clean river water or a fishery, may often not have a monetary value assigned to it, leading to it becoming over-exploited because there is no 'cost' to using it, and no one to control access. (Clark & Grantham Research Institute 2014; Morey 2014:4)

An excellent example of externality costs outweighing the economic return of a particular economic activity can be seen in the example of the Chinese logging industry. Extreme logging of natural forests over the period 1949-1998 resulted in the loss of ecosystem services (such as soil retention, soil nutrition, and watershed protection, amongst others), worth as much as US$12 billion per annum. In 1997 severe drought caused the Yellow River to dry up for more than half a year, causing major water shortages. This was followed by massive flooding the following year, more than four thousand deaths, and the displacement of millions and economic damages of around US$30 billion. It is suggested that the 'true' cost of timber, incorporating all externalities into its price, may be nearly three times what it actually fetches in the market place. Subsequently, conservation policies have been imposed to prevent this sort of deforestation (Bishop et al 2010:5).

The City of Cape Town's Economic Growth Strategy explicitly incorporates this into its thinking: *"Studies indicate that developing countries, and particularly water-scarce regions such as the Western Cape, are particularly vulnerable to these processes of [climate] change. Effective environmental resource management, together with climate change adaptation and mitigation measures, must therefore be core components of any forward-looking approach to economic growth."* (CoCT 2013a:43).

3.2.2.6 Social effects: poverty and unemployment

As much as the industrial economy has improved the material wealth of many, these liveability gains have not been equally shared around the globe. Billions live in dire poverty in the developing world. In order to lift these people out of poverty, their countries need to make vast economic progress. At the same time, the economies of the developed world also continue to grow. Unfortunately, economic growth is a path that has conventionally, for the last two centuries, meant employing more carbon-intensive industry. Yet it is also clear that humanity must move away from such industry for its own survival and that of the planet. Thus there is a great need to transform our carbon economy into a pathway of development which ensures environmental sustainability and remediation, and provides a decent standard of living for humanity into the future. The 2006 Stern

Review, considered a landmark paper in the critique of the conventional economic system, unambiguously intertwines environmental remediation with growth economics: *"tackling climate change is the pro-growth strategy for the longer term."* (Stern 2006:viii)

In the case of industrially-driven climate change, the poor are disproportionately affected. Firstly, because in many cases the poor of the world are pushed to live and farm in the marginal and unprofitable areas that are more prone to the effects of natural disaster than others (such as swamps, floodplains, or already drought-prone land). Secondly, because the poor are under-resourced by definition, they are thus less able to deal with an environmental disaster like a flood or a drought. Thus the adverse effects of climate change: droughts, floods, shortages, and other effects will be felt more by the poor, rather than those who presently benefit directly from the economic activity.

Furthermore, as climate change is expected to have a cumulative and increasing effect over the next few decades and century, future generations will also bear a greater proportion of the externality burden than the current generation (Clark & Grantham Research Institute 2012). For example, while over the next 50 years climate change is expected to produce serious water shortages and food insecurity (especially with respect to crops and fisheries) (IPCC 2014:13) beyond that, the cumulative damage is set to increase – under all IPCC scenarios *"A large fraction of anthropogenic climate change resulting from CO_2 emissions is irreversible on a multi-century to millennial timescale, except in the case of a large net removal of CO_2 from the atmosphere over a sustained period,"* putting the livelihoods (and lives) of the poor and future generations at risk (IPCC 2014:16). As resources become scarcer, this tends to burden the poor disproportionately, as they spend a larger fraction of their income on food, energy and travel costs. There is evidence that increases in food prices pushed 44 million people into poverty in 2010, and caused rioting and protests in 48 countries in 2007-08 (Dobbs et al 2011:7-8).

At the same time, increasing mechanisation of industry has meant that many jobs that formerly would have been done by human labour are now being done by machines. Coupled with a burgeoning population, this means that ever more people are unemployed, and likely to remain so. Furthermore, a low level of material wealth is often accompanied with a lack of access to education. This means that, as technology advances, many now become unemployable, the skillsets of many people will simply no longer have a place within the 21st century economy.

"The causes of these crises vary, but at a fundamental level they all share a common feature: the gross misallocation of capital. During the last two decades, much capital was poured into property, fossil fuels and structured financial assets with embedded derivatives. However, relatively little in comparison was invested in renewable energy, energy efficiency, public transportation, sustainable agriculture, ecosystem and biodiversity protection, and land and water conservation. Most economic development and growth strategies encouraged rapid accumulation of physical, financial and human capital, but at the expense of excessive depletion and degradation of natural capital, which includes the endowment of natural resources and ecosystems. By depleting the world's stock of natural wealth – often irreversibly – this pattern of development and growth has had detrimental impacts on the wellbeing of current generations and presents tremendous risks and challenges for the future." (UNEP 2011a:14)

3.2.3 The green economy as solution

3.2.3.1 Roots in sustainable development

The idea of the green economy is built upon an earlier concept: that of "sustainable development," a term most clearly rooted in the *1972 Declaration of the Stockholm United Nations Conference on the Human Environment*, which agreed on 26 principles interlinking the dignity of human life, the responsibility to protect the environment, and the relation of the economy to both (UNEP 1972). The *1980 World Conservation Strategy of the International Union for the Conservation of Nature* was the first document to put forward a concept known as 'sustainable development' (IUCN 1980). The *1987 Brundtland Report* modified the IUCN vision to conceptually link environment and economy ('development' in the wording of the report) as inseparable from each other, and centralise the idea of 'intergenerational equity' – all should benefit alike from both environment and economy, including generations yet unborn. In the wording of the Report: development is sustainable when it *"meets the needs of the present without compromising the ability of future generations to meet their own needs"* (WCED 1987:41). Later definitions of the term were more explicit about incorporating the vital role of the environment: *"[sustainable development should be interpreted as] improving the quality of human life within the carrying capacity of supporting ecosystems"* (IUCN, UNEP & WWF 1991:10). Sustainable development is essentially a concept that seeks to balance humanity's place on Earth across (usually) three dimensions: society, environment and economy. (UNDESA 2012a: 60-63; Death 2014:5). Some authorities add governance, institutions or culture as additional dimensions.

According to UNEP, sustainable development has 4 important steps to achieve:

- Account for environmental costs and benefits fully, through proper valuation of ecosystem goods and services.
- Ensure the primacy of governance and policy as a critical element in informing economic actors, incentivising and regulating correct use of the environment, and creating effective institutions and appropriate infrastructure.
- Continuously monitoring and evaluating environmental and biodiversity degradation, and climate change.
- Fully explore the role of technology in supporting a sustainable future.

(UNEP 2011a: 18-19).

In line with this, the 1989 UK government *Blueprint for a Green Economy* raised another idea that was to become core to the concept: environmental degradation represents a market failure, externalities should be accounted for into the pricing of a resource, and the future prospects of the resource should also be taken into its present-day accountings. (Death 2014: 4). The *1992 United Nations Conference on Environment and Development* (also known as *the Rio Summit*), a major inter-governmental conference in which 172 governments around the world took part, placed the destructive linkages between the economy and the environment squarely on the world agenda. It set the stage for a variety of important forward-looking agreements in the green sphere, such as*: Agenda 21*, *the Kyoto Protocol*, *the Convention for Biological Diversity*, *the Framework Convention on Climate Change,* and *the Rio Declaration on Environment and Development* (UNDPI 1997). The *Rio Declaration* would include such principles as 'polluter pays', the elimination of unsustainable consumption and production, and the use of economic instruments to bring about sustainability goals (Death 2014: 4).

Green economic theory therefore fits into the broad sustainable development agenda, but does not seek to replace it. Rather, it aims to operationalise sustainable development into a strategic economic policy agenda (Organisation for Economic Co-operation and Development (OECD), 2011: 11 in Borel-Saladin & Turok 2013a:211; de Coninck et al 2014:5). That is, green economic theory recognises the leading role that economic activity plays in reaching sustainable development, recognizing "*that achieving sustainability rests almost entirely on getting the economy right*" (UNEP 2011a:17). The worsening effects of climate change in the first decade of the 21st century and the financial crisis of 2008 renewed interest in the concept, as it highlighted the importance of government intervention in the economy. In 2012, twenty years on at the second follow-up conference of the *Rio Summit*, the *United Nations Conference on Sustainable Development* (also known as *Rio+20*), the green economy was presented as one of the two main themes, resulting in a rapid expansion in literature on the subject (UNDESA 2012a:5).

This marks a shift in the literature around sustainable development between the 1992 and 2012 Rio conferences – rather than focussing on the pattern of consumption and production, there has been a shift in focus to dealing with the economy directly – given that it is the fundamental driving force of economic development on the one hand, and environmental harm and social injustice on the other.

3.2.3.2 Contemporary impetus to the green economy

The arguments offered by environmentalists have changed little since the 1980s. However, two crises have brought the green economy concept back into prominence. Firstly**,** the burgeoning **climate crisis** dramatically linked the processes of a carbon-based economy to climatic and human harm. Secondly, **the economic and financial crises** of 2007-08 which re-legitimised the idea of states intervening in economies, strategically-targeted investment and economic planning. Although there has been a growing awareness that the current economic paradigm is unsustainable, challenging it, or changing it has been very difficult. The success of the free market economy, and its ability to create financial and material wealth on an unprecedented scale made it nearly impervious to critique – growth has been the immutable goal of business and government for decades, and to challenge it was to invite derision (Dahl 2009). However, in 2008, the global financial crisis seriously shook this trajectory. The crisis, which has invited some[1] comparisons with the Great Depression of the 1930s, resulted in a serious stock-take of the current economic system (Dahl 2009; Egan 2014; Helbling 2009).

As debate around this matter gathered pace, other issues created by the industrial system also were put on the table: environmental concerns, particularly relating to climate change, as well as the social inequalities that have become such a sustained feature of our present economy. The outcome has been a growing consensus that in solving the financial crisis, our environmental and social woes must also be addressed in order to find an economic situation that is sustainable into the future. "*Importantly, this has included efforts by international organizations, major groups, think tanks and researchers (both supporters and critics alike) to develop operational principles for green economy*

[1] Likely unjustified. Although comparisons have been made, the consensus seems to be that the world economy has suffered a recession rather than a depression. Unlike the Great Depression, the 2008 Financial Crisis attracted swift response from governments and international bodies that avoided many of the catastrophes of the 1930s. See Helbling (2009) and Egan (2014) for summaries of the similarities and differences between the two events.

and green growth, as well as the elaboration of policy toolkits and suites of measures that can be adopted by national governments to shift to a more sustainable economic framework." (UNDESA 2012:62)

Thus it is important to note that the motivation for a move to the green economy comes from two different and often opposing concerns: those who seek a more ecologically sustainable future, and those who see the green economy as a way to improve economic performance (Death 2014:5). To graphically contrast these two views, compare the UNEP definition of green economics: *"one that results in 'improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities'"* (UNEP 2011a:16), against that of the OECD: "*Green growth means fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies. To do this it must catalyse investment and innovation which will underpin sustained growth and give rise to new economic opportunities"* (OECD 2011:9).

The green economy is therefore presented as an increasingly popular mode of addressing the intertwined social, environmental and economic woes of the 21st century, while maintaining the conventional form of the capitalist economy. It promises that economic growth, social progress and stewardship of the environment can be complementary goals (UNDESA 2011:v), that, in mitigating greenhouse gasses, opportunities for economic growth and development will present themselves, and that correctly applied green economic policy will also lead to the eradication of global poverty and redressing of inequality (Borel-Saladin & Turok 2013a:209).

3.2.3.3 Transnational character of the green economy

It is worth noting that many of the effects of our system of globalised trade, climate change, pollution, poverty and other malaises of the 21st century are transnational in character – that is, their effects are felt across man-made and natural borders. This in practicality, has meant that much of the discourse, literature, policy guidance and even funding is developed at the supra-national and inter-governmental level – meaning that international bodies like the UN, OECD, ICLEI, World Bank and so on, have been instrumental in developing the frameworks used by states to implement green economies. This has implications: firstly, in terms of compromise, as internationally agreed upon frameworks must satisfy a wide variety of competing concerns, and secondly, in terms of the effect on state autonomy, as individual state's desires must be subsumed by the needs of the greater good, to some extent.

3.2.4 Summary

This section contained a broad synopsis of the the origins of the green economy. It began with a brief description of how the Industrial Revolution eventually led to a system of global economics which generates mounting environmental and social externalities: resource shortages, ecosystem damage, pollution, and inequality, as well as systemic damage to the global biosphere which has lead to climate change. The section then turned to an examination of the genesis of the green economy: how the term developed out of sustainable development theory, and the contemporary impulses which have led to it being posited as the main tool for tackling climate change as well as other environmental and social ills.

3.3 Definitions of the green economy

3.3.1 Introduction

Having covered the genesis of the concept 'green economy,' we shall now turn to an examination of what it is actually defined to mean by the various bodies promoting it.

3.3.2 Defining the green economy

3.3.2.1 Leading green economy definitions

A summary of some basic definitions of the green economy from various authorities:

Table 2: Green Economy definitions (various authorities)

Authority	Definition
Green Economy Initiative, United Nations Environment Programme	*"Greening the economy refers to the process of reconfiguring businesses and infrastructure to deliver better returns on natural, human and economic capital investments, while at the same time reducing greenhouse gas emissions, extracting and using less natural resources, creating less waste and reducing social disparities"* (Rode 2010:16); *"[a green economy is] one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. A Green Economy is characterized by substantially increased investments in economic sectors that build on and enhance the earth's natural capital or reduce ecological scarcities and environmental risks. These sectors include renewable energy, low-carbon transport, energy-efficient buildings, clean technologies, improved waste management, improved freshwater provision, sustainable agriculture, forestry, and fisheries. These investments are driven by, or supported by, national policy reforms and the development of international policy and market infrastructure."* (UNEP 2010:5)
UNEP *Towards a Green Economy Report* definition, prepared for *Rio+20*	*"In its simplest expression, a green economy is low-carbon, resource efficient, and socially inclusive. In a green economy, growth in income and employment are driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services. These investments need to be catalysed and supported by targeted public expenditure, policy reforms and regulation changes. The development path should maintain, enhance and, where necessary, rebuild natural capital as a critical economic asset and as a source of public benefits."* (UNEP 2011a:16)

World Bank	*"Green growth is growth that is environmentally sustainable. It is efficient in its use of natural resources, clean in that it minimizes pollution and environmental impacts, and resilient in that it accounts for natural hazards and the role of environmental management in preventing physical hazards and excessive commodity price volatility.* *Green growth is a tool to achieve sustainable development, not a competing paradigm. … Green growth can, and in our view must, be designed in a way that makes it inclusive…. green growth should create a green economy, which the United Nations Environment Programme (UNEP) defines as one 'that results in improved human well-being and social equity, while significantly reducing environment risks and ecological scarcities.'"* (the World Bank Group 2013)
International Labour Organisation	*"We define green jobs as work in agricultural, manufacturing, research and development (R&D), administrative, and service activities that contribute substantially to preserving or restoring environmental quality. Key sectors: renewable energy, buildings and construction, transport, basic industry, agriculture and forestry."* (Rode 2010:16)
Danish 92 Group	*"The Green Economy is not a state but a process of Transformation and a constant dynamic progression. The Green Economy does away with the systemic distortions and dis-functionalities of the current mainstream economy and results in human well-being and equitable access to opportunity for all people, while safeguarding environmental and economic integrity in order to remain within the planet's finite carrying capacity. The Economy cannot be Green without being Equitable"* (Danish 92 Group Forum for Sustainable Development 2012:1).
Green Economy Coalition	*"[An economy] that generates a better quality of life for all within the ecological limits of the planet."* (Green Economy Coalition 2012:5)
South African Government	*"The green economy involves largely new economic activities and must provide an important entry-point for broad-based black economic empowerment, addressing the needs of women and youth entrepreneurs and offering opportunities for enterprises in the social economy."* (SAGOV DED 2011:22).
International Chamber of Commerce	*"A Green Economy requires the three pillars (economic, social, and environmental) of sustainable development to work in a mutually reinforcing fashion while supporting progress on social development. Efforts by all actors should reconcile the need for short and medium term profit with longer term systemic change. Economic growth is*

	and will be essential to provide the resources and social equity necessary to build capacity and finance actions in a transition towards a Green Economy." (ICCWBO 2012:2).
South African Institute of International Affairs (SAIIA*)*	*"Green economies are defined as economic systems that take into account holistic remedial measures incorporating economic, environmental (including ecological) and social challenges that stop or reduce economic activities and growth. Central to the green economy is the desire to improve people's lives by combating climate change, energy insecurity and ecological instability. "*(Kaggwa et al, 2013:5)

3.3.2.2 Clarity in terms

As one can see from the table above, there is no single, internationally agreed upon definition for the green economy – UNDESA identifies at least eight varying interpretations used by the UN Environmental Programme, the UN Conference of Trade and Development, the UN Conference on Sustainable Development, the Green Economy Coalition and the South African Government, amongst others(UNDESA 2012a:63). However, UNDESA notes that the varying definitions do have numerous words in common, summarised below according to the three principal pillars of sustainable development:

Table 3: Summary of common words from Green Economy definitions (UNDESA 2012a:60)

Social	Human well-being; social equity; socially inclusive; reduced inequalities; better quality of life; social development; equitable access; addressing needs of women and youth.
Economic	Growth in income and employment; public and private investments; resilient economy; economic growth; new economic activity.
Environment	Reducing environmental risks and ecological scarcities; low carbon; resource efficient; reduce carbon emissions and pollution; enhance energy and resource efficiency; prevent loss of biodiversity and ecosystem services; within ecological limits of the planet; environmental responsibility; finite carrying capacity.

It is also recognized that the internationally, distinctions between terms such as 'green economy,' 'low carbon development,' and 'green growth' [2]are fairly negligible and they have come to be used almost interchangeably (UNDESA 2012a: 60-63; Death 2014:5). The International Chamber of Commerce confirms this interchangeability, but however does include a slight expansion:

- 'green growth' implies a self-driven *bottom-up* operational approach by companies (or other economic actors) integrating sustainable and green solutions into their products and processes, ultimately making their particular sectors and value chains more green.

[2] Please note that 'green growth' as used in the international literature contains a slightly different connotation when compared to Death's (2014) 'green growth' dialogue emphasis.

- ‘Green economy’ implies a more *top-down* approach whereby system-wide challenges are addressed at the strategic macro-economic scale. This is where sustainability becomes mainstreamed into government policy (ICCWBO 2012a:10; ICCWBO 2012b:2).

UNDESA notes that this top-down approach may be because many of the foundational documents promoting the green economy are produced at the international level, and tend to be aimed at governments and leadership bodies, where the emphasis is on strategy and policy to address system-wide challenges (UNDESA 2012a:61). This top-down approach coincides with something of a sea-change in belief regarding the role of government intervention in the economy and society. In the wake of the financial crash, state bailouts and the various Wall Street scandals of the last two decades it has become increasingly clear that the economic liberalism of the recent past is not working – that is, the economic philosophy of allowing markets and market-actors to act with minimal interference and oversight has not led to optimal outcomes.

3.3.2.3 Dialogue emphasis according to Death (2014)

Vagueness in definition can be useful, as it allows different actors latitude in how they interpret and implement efforts to ‘green’ the economy (Death 2014: 5). Death (2014:6-9) highlights four different emphases dialogues on the subject tend to take:

1. **Green revolution**[3] – transformation of the entire economic and social system in such a way that its contradictions, externalities and other issues are firmly resolved. It involves a revolution across society to include such elements as capitalism, the state-system, race-relations, etc. Alternative economic systems are advocated, such as de-growth and steady-state economics. This approach was championed by indigenous peoples’ organizations and Bolivia at the *Rio+20* conference.

2. **Green transformation** – the assumptions of the present economic system (growth models and development plans) remain the same, but the over-arching goal is re-aligned or redirected towards sustainable development. Economic growth drives progress, the environment is seen as a resource, and states play a crucial role in mobilising public investment and stimuli for green ends. There is an unequivocal focus on social justice, equity and employment creation (for example through public works programmes). This stream of green economics is aligned with the Brundtland report’s vision of sustainable development, as well as various articulations of the green economy from UNEP and the ILO.

3. **Green growth** – this views the green economy as the key market opportunity of the future. Whether carbon trading, organic food, technological inventions, this discourse sees the green economy as a means to future prosperity, increased employment and concomitant improvements in the livelihoods of the world’s poor. Rather than focussing on the limits of the environment and the restraint of economic activity, this view emphasises new forms of consumption, and new products and services. It also reflects an emphasis on promoting a particular flavour of growth economics over using

[3] Note that this term ought to be distinguished from the agricultural “Green Revolution” from the 1950s onward which had to do with advances in fertilizer and pesticide technologies

regulation to restrict harmful economic systems. This system is favoured by organizations including the World Bank and the Development Bank of South Africa.

4. **Green resilience** – this discourse is particularly cautious and reflects views that are sceptical and apprehensive towards green economics, and thus attempts to preserve the status quo as much as possible. It reflects concerns (usually of states and large market actors) towards potential losses of advantage in markets as technology changes (either through regulation or innovation), the threat of new forms of protectionism (higher production standards could exclude developing economies), and changing forms of governance, as well as a fear that new regulations may neglect the principle of 'common but different responsibilities' undermining the efforts the Global South seeks to remedy in addressing its own specific issues which may be very different to the North. This stream emphasises particular technologies and techniques of 'resilience' such as climate adaption, insurance schemes, and improvements in self-sufficiency. This discourse is presented by many G77[4] countries, including China.

Alfredsson (2012) notes some fundamental differences between the conceptions of conventional economics and green economics:

Table 4: Conventional versus Green economic conceptions (Alfredsson 2012:16)

Conventional economics	Green economics
Maximisation of production GDP and short term profits	Maximisation of marginal utility of consumption, long term income and yields
Quantitative economic growth	Qualitative economic welfare, includes equitable distribution
Exploitation of resources	Stewardship of resources
Short-term profit focus: Externalized costs, short-lived products, linear production systems, labour productivity	Marginal utility focus: internalization of all costs and externalities, efficient uses of resources, long-lived products, circular product life-cycles, focus on eco-productivity

3.3.3 Summary

This section gave an overview of how different international bodies define the green economy. At a basic level, most definitions attempt to balance the spheres of society and the environment through interventions in the economic sphere, however, there is no internationally agreed upon definition. It was noted that high-level definitions tend to have a degree of vagueness and flexibility of interpretation. It was also pointed out, following Death (2014) that despite this ambiguity in terminology, the literature on the subject appears to take four main emphases: green revolution, green transformation, green growth, and green resilience.

[4] Group of 77: A group of developing countries in a loose alliance of mutual support for negotiations at the UN.

3.4 Transition Framework

3.4.1 Introduction

Most green economy frameworks phrase their structures in terms of *transition*, emphasizing a concern with process, rather than reaching a specific, foreordained end product. That is, the green economy is seen as an ongoing process of incrementally shifting the conventional economy to one that is sustainable, socially equitable, environmentally secure, resource efficient, and so on. This section will present an analytic overview of the high-level conceptual foci or ideals presented in the international literature as facilitating a green economic transition, rather than listing specific policy mechanisms. This overview provides a "Transition Framework" which will be used later in this dissertation to evaluate the green economy of Cape Town, and identify points of divergence between the "ideal" green economy and its implementation in a real-world situation.

The reason for keeping this analysis at this high-level is that an examination of the many policy mechanisms promoted by the literature would be beyond the scope of this dissertation to encompass. Rather, greater utility is to be found in examining the concepts that underpin what the various authorities suggest as necessary for the green economy transition. These concepts will provide a framework with which to evaluate particular real-world case studies.

3.4.2 The Transition Framework

At a high level, an evaluation of the literature delivers the following commonalities, allowing a transition framework to be created. The Framework has the following elements or foci:

I. Government-led approach
II. Urban and spatial focus
III. Infrastructure-driven
IV. Conventional economics
V. Employment and education are interlinked
VI. Innovation- and technology-driven
VII. Focus on management of natural capital
VIII. Sectoral approach

These are expanded upon below.

I. Government-led approach

Proactive transition management

A key issue with the transition to the green economy is that it requires deep cultural, social, technological and economic transformations. That is, it is not simply a quick shift to new business practices, but a change that must encompass all of society in a transition to a different plateau – the change must become embedded in society and the way it organizes itself (Mulder 2007: 253). UN-Habitat suggests that the transition be proactively managed via scenario-planning to address uncertainty and explain possible outcomes, and the incorporation of multiple domains and actors into planning, without neglecting the integration of long-term outcomes into short-term policy (UN-Habitat 2012:26). Rather than creating a predefined outcome, a variety of possible futures is imagined, selection of which is made by the action of markets and cooperative decision-making amongst stakeholders (Parto et al 2007:295).

UN-Habitat promotes a process known as Multi-Level Perspective (MLP) transition theory which sees the co-evolution of society and technology as crucial for transition. A change outside of the control of actors in a particular system occurs at a landscape level, as a result of factors like climate change, international economic events, social patterns, etc. This puts pressure on actors within that system to alter their regulatory schemes, behaviour, networks or technologies, which in turn open up the *potential* for practices formerly limited to very specific niches (e.g. solar energy, hybrid cars) to spread (UN-Habitat 2012:27). However, niches will not spread to the mainstream by themselves. The job of government is to identify useful niche practices and support the mainstreaming of them into the system through policy innovation, the building of credibility for these alternatives through the formation of discourse coalitions and their spread to multiple levels of governance. Local initiatives should be connected to global discourses and networks, legitimizing and entrenching the transition to new systems (Späth & Rohracher 2011:461-462). Cities, in particular, may be sites that facilitate socio-technical transition, through the social contexts, institutions, infrastructures, capabilities and resources specifically available to them, which can deviate quite strongly from the dominant regime. This creates a space that can actively facilitate the integration of a new socio-technological regime (Späth et al 2011:475).

Carlo Jaeger in De Coninck et al (2014) outlines several areas which he believes are critical to fostering a green economic transition:

- Consolidate the climate change narrative, and commit to limit global warming to 2 degrees Celsius. As a future of climate change is still a deeply uncertain one, limits are subject to review.
- Underline the need for green growth to be inclusive and decrease poverty.
- Strengthen the nation's commitment to climate change mitigation policy, and review their progress.
- Foster transnational 'clubs' or bodies that pursue climate policy. Three areas are suggested in particular: greening cities, financing sustainability, and developing skills for the green economy.

(de Coninck et al 2014:7-8)

The ILO notes the following aspects as being important elements in transitioning organisations:

- Senior leadership plays an important role in making funding available, leading the transition, and educating and motivating employees.
- The role of government in incentivising the transition is underscored. Funding, and surprisingly, public recognition and other tangible benefits, are important motivators.
- Organisations that encourage and even reward their clients and value-chains to become more sustainable may generate wider transformation.
- The green economy needs to be the long-term concern of the entire institution (or society), rather than just a select 'green' team.
- Partnerships are seen as important in accelerating the greening process and increasing the impact of its practices.
- Creating the perception that the green economy is obligatory and necessary (not just a luxury) will determine how deeply and swiftly its practices are adopted.

(ILO 2015: 39-41)

Top-down governance approach

At a high level, green economic theory is a top-down approach, premised on the idea that primary leadership direction will come from supra-national bodies and national governments. In part, this is because green economic theory is based on an understanding that there is a need for a global change across societies, economies, and technological regimes, and this is unlikely to happen if it is not directed by supra-national fora that provide a space for discussion, negotiation, cooperation, and coordination across disparate countries. These fora play a critical role in catalysing debate and knowledge-sharing, agreeing on common goals and monitoring progress to achieving them, and supporting the progress of national governments in achieving their goals. At the same time, it is recognised that in order to produce change on a national scale, the wide-reaching resources, the power and authority of domestic governments is needed to create and implement policy and regulations, as well as providing finances, infrastructure and services to enable the achievement of national green economic goals. Governments are also well-placed to kick-start public-private cooperation, as well as produce integrated decision-making across stakeholders, resulting in coordinated, transparent and predictable outcomes which enable the private sector to come to the party as well. UN-Habitat suggests that the governments should foster an atmosphere of encouragement, support and open-mindedness towards the networks and the necessary R&D needed to establish the green economy (UN-Habitat 2012:25).

All levels of government must be coordinated and aligned towards facilitating the outputs of green economy policy. Ministries should work together to ensure a coordinated approach across government and society which considers inter-linkages, engages with stakeholders, and produces clear, predictable, transparent, and useful policy frameworks and support. A key area is collaboration between government, business and civil society to create partnerships, and leverage skills, amongst others (ICCWBO 2012a:38-42).

Regulation-driven

Another key element of the institution of green economics is the use of policy and regulation to drive its agenda. Borel-Saladin & Turok (2013a:213) suggest that conventional economic systems allow (or even subsidise and promote) industries to create high levels of emissions, run inefficiently, and otherwise produce unaccounted-for externalities. Government interventions to rationalise this situation should aim to move economic behaviour from conventional dirty practices towards those that are sustainable, efficient and do not generate externalities. Mechanisms suggested include: rationalisation of support away from dirty towards clean industries and processes, corrected taxation and pricing regimes, incentivisation, regulation, accounting for externalities, proper valuation of natural resources, addressing behavioural biases, and improving information flows. A further step would be to actively disincentivise activities that are unsustainable or harmful via taxation, fining, or even criminalisation.

UN-Habitat considers government action on the following factors to be crucial: The creation of sound regulation and enforcement systems, both within country and on international scales. The use of taxes and market instruments to incentivise investment in green industry, while focusing government investment in areas that would stimulate both green and labour-intensive industries. Government spending should however be limited where it may result in the depletion of natural capital. Lastly, government is uniquely well-placed to ensure correct and targeted skills development in the new green industries, as well as ensure that those transitioning out of carbon-intensive

industries are retrained in order to be able to participate in the green economy (UN-Habitat 2012:10). Of foremost importance however, is the establishment of strategic planning and organizing capabilities in order to coordinate cooperation and decision-making on a regional basis, and to exploit the competitive advantages that the region might have (UN-Habitat 2012:26).

The ILO adds the following:

- The introduction of environmental taxes that move the burden away from labour to those who use the resource and create pollution;
- The provision of support to small and medium-sized enterprises;
- Sustainable development strategies that ensure employment, decent (meaningful, safe, properly remunerated) work, inclusion and equity;
- The role of education in facilitating work transitions and improved employability;
- And an ongoing social dialogue as key to ensuring sound policy and widespread embracing of change.

(ILO 2012:5-8)

This process is not expected to be simple. Changing well-established 'institutional regimes' (such as zoning schemes, tariffs and funding)developed to facilitate a previous growth paradigm, can be a politically fraught activity, resulting in powerful lobby groups being drawn into the fray, often eroding the good that the new regulation sought to achieve (McFarling 2014:551). Gunningham in Parto (2007:17) recognises this challenging process, and notes that it has resulted in shifts from directed, top-down governmental command-and-control regulation, to a second generation of more flexible and responsive regulation. This includes governmental, as well as self- or co-regulation, voluntary agreement, incentives, standards, as well as regulatory responsiveness to empirical research. Second generation regulation relies heavily on context, trust between regulator and regulated, and sharing of environmental problems. Policy flexibility is needed to allow experimentation and innovation, and should use multiple instruments. Which approach is more effective only time will tell, but the authors note that in cases where trust is lacking or environmental data is disputed, it may be better to proceed with formal regulation and enforcement (Parto et al 2007:17, 293).

At the same time, it is necessary to concurrently support activities that are sustainable or that create benefits for society or the environment. This can take the form of incentivisation, financing, business development, product support, the creation of specialised geographic sites for green industries, etc. The speed at which change is debated and then implemented is also important: the World Bank argues that short-term interventions (next 5–10 years) are the most important to prevent lock-ins and show immediate benefit to society in the period in which the costs of greening growth are highest and most keenly felt (Borel-Saladin & Turok 2013a:210).

Parto *et al.* (2007:13) point out that a green economic transition should be accompanied by funding for research and development, and that compliance with well-defined and established standards (such as the ISO 14001) is an important step with respect to effective regulation. Investment from the business sector needs enablement through predictable, clear and sound policy and regulatory frameworks. Regulation can also be used to remove non-economic barriers that face green economy take-up, such as administrative hurdles, lack of information and social acceptance (ICCWBO 2012a:20).

Government as chief financier of the transition

It is not assumed that the green economy will simply happen by itself, and thus investment plays a crucial role in stimulating green economic activity. At an international level, support networks and financing for national green agendas are available. At a national level it is the task of government to identify, encourage and support domestic green economy activities. Government policy is critical for nurturing and incentivising green innovation and for choosing the future it wants to achieve. the actions of private business and entities are not sufficient to do it alone – indeed, within competitive markets there is little incentive to invest in product or process change, as returns are quickly competed away, resulting in market failure. Removing perverse subsidies that continue to support dirty industry and energy has the dual effect of preventing the hampering of green technology, as well as improving economic efficiencies (by removing those from the market who exist because of subsidies or under-priced or even free resources (UNEP 2011a:22).

"*In a green economy, growth in income and employment are driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services. These investments need to be catalysed and supported by targeted public expenditure, policy reforms and regulation changes."* (UNEP 2011a:16)

Third party involvement

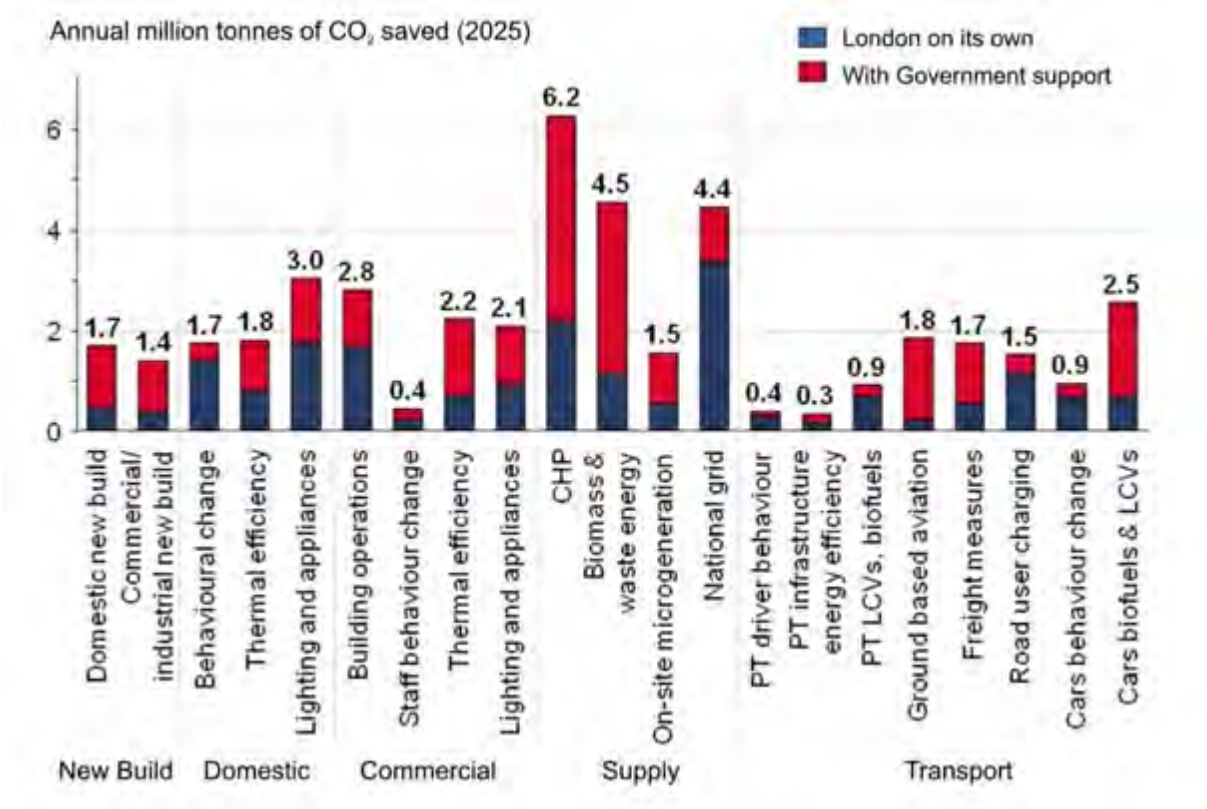
At the same time, good environmental regulation alone is not the main driver for industry to improve its green credentials. Adeoti (in Parto & Herbert-Copley 2007:15) identifies a broad group of factors such as communities, public corporations affected by pollution, non-governmental organisations, internal company requirements (particularly where the parent company has international branches), and suppliers of technology, whose combined influence has considerable impact on the greening of an economy (Parto & Herbert-Copley 2007:15-16). However, unless they are supported by formal legislative measures, it is difficult for them to effect improved environmental change (Parto & Herbert-Copley 2007:291). From a more global perspective, international supra-national and cross-border agreements may also have a significant impetus on the adoption of green practices. For example, in order for Mexico to enter into trade with the USA and Canada under NAFTA, it is bound to meet certain environmental standards (Parto et al 2007: 291).

II. Urban and spatial focus

Cities are critical geographical sites for the initiation and development of the green economy, for a number of reasons: worldwide, as global populations have risen steadily over the course of the 20th century, there has been a massive shift from populations mainly living in rural areas, to them living in urban areas. In 1950, 30% of the roughly 2.5 billion people in the world lived in cities. By 2030, as the global population moves past 8 billion, 60% of this population is expected to live in cities (Rode 2010:2). Africa, in particular, has shown both rapid population growth as well as rapid expansion of its cities (Rode 2010:80). Cities are also generally critical parts of the economic engines of their countries, being the nexus for financial flows as well as political, social and economic decision-making. This is the case even in countries where the largest industries may be sited outside of urban centres (for example in mines or agricultural areas). Urbanizing populations are associated with increased CO2 emissions (Rode 2010:8), and as city socio-economic indicators and population per capita incomes tend to be higher than their hinterlands (Rode 2010:12, 65), it is clear that urban areas will be central sites of consumption of resources and waste emissions. Therefore, it is urgent that green economic policies target cities in order to make the greatest gains.

At a city-level, the impact of green economic practices can be significantly augmented by national government aid. For example, the figure below from the Greater London Authority shows how future projected CO2 savings can be greatly bettered with government support, in some cases tripling the savings that city interventions alone would be able to achieve (Rode 2010:85).

Figure 3: Medium Term CO2 Savings by Measure (Rode 2010:85)



Gibbs and O'Neill (2014) note that the spatial context of a green economy transition are all too often ignored in the literature of green economy transitions, and where it is, the focus is generally on a national scale. City and regional scales are in fact a key locations from which to use Multi-Level Perspective theory to investigate the interrelation between niche, regime and landscape. While relatively small scale, trialling innovations at the sub-national scale is very useful for trialling, scaling up and then disseminating (Gibbs, O'Neill 2014:204). Cities in particular, act as bridges between niche and regime, providing spaces of social context, actor networks, talent, culture, institutions, infrastructures, and complementary technologies, business and support structures (Gibbs, O'Neill 2014:204-5). Gibbs and O'Neill cite the example of Boston – part of the drawcard for green companies moving to that city is its nearness to centres of higher learning and other green industries (ibid. 207).

Götz & Schäffler point out *"space is not neutral in how an urban economy works — any urban economy produces, and is produced by, its particular built environment and infrastructure. … The green economy takes this understanding and propounds the inverse of how (sub)urban space and consumption-driven economies developed in lock-step over the last half century."* (Götz & Schäffler 2015:84) While the mix of a city's infrastructures is important, so too are their relationships to each other – both in the sense of geographical proximity and in terms of relational functionality.

Agglomeration advantages – that is, the advantages that accrue from having related industries and strategic infrastructures in close geographic proximity – are necessary to exploit, and should be encouraged when decisions are made around the siting of new infrastructures, industries and businesses. At the same time, by understanding how various actors in the green economy are relationally and functionally networked to each other, synergies and efficiencies can be induced and strengthened through specialization and cooperation. For example, siting a technological innovation company near a university would benefit both organisations – students would have improved access to jobs, while the company would benefit from access to trained graduates and research know-how. From a broader province- or nation-wide perspective, it is possible for government to realize synergies between neighbouring cities, and explore their particular competitive advantages (UN-Habitat 2012: 12-14, 19; Rode 2010:51).

III. Infrastructure-driven

Elements of a country's infrastructure (built environment, transport, energy, water, sanitation) are important in greening economic systems – they represent a large investment in resources and are generally designed to last into the long term, and therefore play an important role in shaping the future of how 'green' a society is. A city that invests in creating low-carbon public transport infrastructure, for example, will have a greener transport future than a similar city which only invests in road infrastructure, all else being equal. Beyond reducing externalities, large scale green infrastructures may also produce co-benefits such as creating new jobs and industries, increasing productivity, and improving public health (Borel-Saladin & Turok 2013a:215). The particular type of Infrastructure and assets that an urban space contains will determine to a large extent how its consumption economies will develop. Retrofits or new-builds geared towards sustainable practices will provide considerable long-term green prospects. A policy framework to incentivise and otherwise support such a transition is crucial. (Götz & Schäffler 2015:84)

Urban infrastructure should support the successful functioning of the city – strategic facilities such as harbours, airports, and universities will be important to grow a green economy in terms of research and the transport of goods to other markets. At the same time, infrastructures that contribute to a good quality of life (such as schools, parks and amenities) will help attract skilled workers from farther afield (UN-Habitat 2012: 12-14).

IV. Conventional economics

Green economic thought, in general, is predicated on standard market dynamics and therefore, from an urban perspective, a city should have at least some of the characteristics that are associated with market success. Skilled workers, and the capacity to innovate, adopt and adapt to new technologies are also highly important for maintaining a competitive edge in the green economy. The economy itself needs to reflect a diversity of activities, as well as the capacity and flexibility to expand into new areas, and naturally benefits from a stable macro environment on a wider scale (UN-Habitat 2012: 12-14). Cities should explore their competitive advantages, both geographic: how the location of the city may give it certain advantages; and functional: how the particular set of industries, businesses, infrastructures, sectors in a city may provide it with a unique advantage (e.g. in tourism, or finance, etc.). Competitive advantage is also facilitated by such factors as: the quality of governance and institutions and their ability or willingness to support innovation and entrepreneurship, human capital, and legacy. Infrastructure both physical (such as roads, hospitals,

banks, etc.) and institutional (planning, governance, administrative, civil society) is also important (UN-Habitat 2012:12).

As much as green economics is an attempt to repair the externalities arising from the conventional economy, the basic philosophies of conventional market economies are accepted fairly uncritically. For example, the idea that growth should be continuous is left mostly unexamined. Despite the incorporation of issues of equality into the discussion, there is little discussion of what prosperity is constituted of, what a sustainable level of prosperity is, or how to redistribute wealth, or what standard of living is aspired to as a fair state for all of society.

The greening of an economy is a long-term project, encompassing multiple sectors and industries, and while efforts are underway all over the globe to create green economies and industries, the question of whether the green economy will result in the economic and job growth it promises is still unresolved. Especially in the short term, greening economies may under-perform in comparison to carbon-heavy conventional economies that are already optimised, and may require incubation and nurturing. Such forms of protection do raise the question of how competitive the green economy effectively is in comparison to a conventional one, and also whether the increased costs will undermine efforts to move to a green economy.

V. Employment and education

Employment creation through green jobs

A key promise of the green economy is the creation of a host of new or improved green industries which will result in green jobs. Employment growth is presented as a particularly hopeful aspect of the green economy, particularly in the wake of the downturns in the global economy. Green jobs are ones that contribute to conserving or restoring the environment by, for example: protecting ecosystems and biodiversity, reducing resource inputs through efficiency strategies, waste and pollution avoidance/minimisation, greening value-chains, and reducing greenhouse gasses. There is also an insistence that these new jobs should conform to standards of social equity – that is, be inclusive, equitable, poverty-busting, have adequate wages, safe working environments, and union protection (Götz & Schäffler 2015: 82-83; UN-Habitat 2012:10-11; ICCWBO 2012a:35-36).

The question of whether green jobs will actually materialize is a thorny one to answer. For example, particularly in the energy industry, there exists an obvious disjuncture in employment potential between coal power and the concomitant labour-intensive coal mining industry on the one hand, and the renewable energy technologies which are intended to replace them, on the other. New avenues will therefore need to be opened up in order to absorb job losses from conventional dirty industries. Whether this will happen at the necessary scale, and whether it is possible to retrain workers effectively for the green economy, will vary greatly depending on individual countries and the spread of green sectors available.

Education

As the economy moves towards more sustainable practices, workers in conventional 'dirty' industries might find their jobs at risk, as support for these industries begins to fall away. While both the OECD and UNEP believe that such job losses will be offset by the growth of employment in the new green industries, they note that a critical issue will be ensuring the smooth transition of workers from old to new industries. Hence, green economic theories emphasize the role that education plays in the green transition: workers require training in new skills, as well as re-education for the green

economy (Borel-Saladin & Turok 2013a:214). Carefully laid policy and support from government is needed in order to ensure that the right educational agenda is set so that reskilling aligns workers with the needs of the market, and prevents an increase in unemployment (ICCWBO 2012a:32-33, 35-36). Importantly, a move to new industries will not be successful unless distortions in the labour market / unappealing business conditions are dealt with. This is of concern as the World Bank singles out South Africa as an example of a country with serious hindrances (such as regulatory hurdles and skills shortages) to the development of green industries (Borel-Saladin & Turok 2013a:214). More generally, there is a need to continuously raise awareness and understanding around global sustainability issues by knowledge promotion, support, dialogue and the creation of a shared vision (ICCWBO 2012a:30-31). Particular issues are the consolidation of the climate change narrative, and increasing commitments to limiting global warming through carbon reductions and the greening of society (de Coninck et al 2014:7-8).

VI. Focus on innovation and technology as drivers

Literature on the green economy often places a fair degree of emphasis on the role of innovation and technology in the green economy transition. This is because the technological regime present in a particular industry has a direct bearing on how sustainable that industry will be into the future, and the degree of harm its processes or products do to the environment. Mulder (2007:254) classifies types of technology according to their effect on the environment:

(i) Preindustrial technologies, which use renewable resources with variable levels of efficiency.
(ii) Classic environmental technologies, which mitigate their emissions by simply relocating their harmful side-effects away from human settlements.
(iii) Good housekeeping technologies, which attempt to mitigate environmental harm via improved efficiencies and lowered emissions where possible.
(iv) End-of-pipe technologies, which prevent pollution after the process. These may require extra resources in order to work successfully.
(v) Process adaptation/damage prevention technologies prevent pollution from arising during the process, and aim for highly efficient resource use.
(vi) Sustainable technologies, which work within the carrying capacity of the planet, use renewable resources, and aim to achieve a harmonious balance between man and nature.

The green economy aims to ensure a technical transition from the preindustrial and classic to regimes (iii) through (vi), with an ultimate aim of complete sustainability for all industries.

There is a great deal of hope that countries with a low level of infrastructural and industrial development will be able to 'leapfrog' the polluting and hazardous conventional technologies of the developed world, and institute sustainable technologies directly. Thus for example, a country with no energy generation infrastructure may begin by building relatively inexpensive and quickly-constructed solar energy farms, rather than expensive coal power plants, which may take decades to complete. At the same time, the type of technology used may also solve other issues. UN-Habitat (2012:9) notes that green economic development need not only rely on high-tech interventions, but if labour-intensive technologies are chosen, for example, they may mitigate poverty and unemployment.

Government is to play a critical role in encouraging green innovation, or supporting specific change technologies and sectors through incentivisation, subsidisation for R&D, and support commercialisation and diffusion of green technologies (Borel-Saladin & Turok 2013a:214).

VII. Managing natural capital

Natural capital includes both renewable (solar, wind, fisheries, etc.) and non-renewable natural resources (oil, gas, mineral, water, etc.), cultivated renewables (agriculture) as well as ecosystem services (erosion prevention, flood mitigation, water cleansing, etc.). Natural capital, as with any sort of capital, requires good stewardship for economic growth, and the different types of resources will require different policy approaches. Many of the world's poor also depend heavily on natural capital and therefore good management of these resources is seen as critical to the alleviation of poverty (Borel-Saladin & Turok 2013a:214-215).

A key issue with conventional economics is the practical separation of nature from human activity – economic decisions are made with scant consideration for their environmental consequences. *"Economic growth has traditionally relied on systemic evasion of environmental costs of extraction, production, distribution and consumption. However, these externalised costs are never permanently removed, only shifted in location and time, and inevitably return to haunt the economies that sought to avoid them."* (Götz & Schäffler 2015:84) Only 6 of the largest 100 companies by revenue in the world in 2008 reported taking actions to reduce their impact on the environment, while others studies revealed that most companies limit public disclosure on environmental harm, and rely on qualitative descriptions instead of performance-based metrics (Bishop, Bertrand, Evison, Gilbert, Grigg, Hwang, Kallesoe, Vakrou, van der Lugt, Vorhis 2010:8). An important step forward is therefore creating an efficient feedback system from environment to economics, so that externalities can be measured and costed into economic actions.

Life-cycle approach

Considering the functional end-use of a product or service may not be enough to decide whether it belongs within the green economy. Innovation needs to be systemic and go beyond simple changes to technical components (e.g. filters on emission pipes) to include holistic life-cycle approaches (Parto et al 2007:294). One must consider the 'greenness' of the chain of inputs and processes that result in the final product – a dirty enough chain can disqualify an otherwise green product. Green products and services also cannot be considered independently of their linkages to other products/services, and the emissions associated with the transport of the good or service need to be taken into account. Furthermore, even if a certain sector is a significant part of the green economy, it is not possible to tell, simply from that information alone, whether that sector will contribute proportionally to a cleaner economy. For example, while financial services may form a significant part of the green economy in a particular city, fostering its growth may be ineffectual in contributing to an overall cleaner economy, if the city were to not to deal with its carbon-based power generation base (Ebert 2014:7-8).

A life-cycles approach means assessing the entire value-chain of a product or process: one must understand the cost, benefit, environmental and social impact at every stage of a product or process's life-cycle and its place in the larger biosphere, with the ultimate aim of neutralizing economic impact on the environment, and ensuring that wastes are either re-used or safely and timeously broken down by natural sink. It may mean including things quite distant to the product or process itself – how the energy used in the activity is generated, for example. This requires product/process innovation, improved impact measurement and research (ICCWBO 2012a:27-28).

A function of green technology is to achieve 'decoupling,' that is, grow the economy while decreasing the amount of resources used in that growth. This may mean continually improving efficiencies in product and process life-cycles, however, ideally it means that the economy begins to substitute material inputs with renewables, re-use wastes, or develop sectors that are less resource-intensive (for example, the finance industry) (Götz & Schäffler 2015:85).

Mulder (2007), in talking about the particular industrial technologies of the green economy, highlights the importance of going beyond simple environmental protection, by including the recovery capacity of the planet as well. Rather than using economic potential and seeing how far we can throttle this back, the safer route should be to bring our economic activity to be in line with the recovery capacity of the biosphere: *"[Sustainability] means more than merely producing goods without pollution or ecological destruction. … [It] means fulfilling people's needs in such a way that the recovery capacity of the planet as well as the recovery capacity of local ecosystems are not exceeded. The aim is to bring the worlds' use of natural resources within the boundaries that are set by the earth's recovery capacity. What are the preconditions that the need for sustainable development sets for these innovations*." (Mulder 2007: 257)

Correctly valuing resources

A key step is the correct valuation of hitherto un-valued natural resources, services and sinks (UNEP 2011a:19). A natural resource like a forest for example, is conventionally given a monetary price for the value of its wood once logged. However, if the forest's role in the larger ecosystem and broader chain of human usage is correctly valued, it may be discovered that its value as a natural sink for carbon dioxide, a safeguard against soil runoff and flooding, or as a site of pharmaceutical research, may far exceed the value of the once-off sale of its wood and present a compelling case for leaving it untouched. "*Green assets can be counted as infrastructure, [as they provide] ecosystem services equivalent to the functions of conventional hard infrastructure networks. "* (Götz & Schäffler 2015:84)

Correct pricing also makes it easier to assess the true cost of a particular activity to society and the environment at large. This makes for more meaningful assessments when comparing technologies. A coal power plant, for example, may be able to produce energy more cheaply than a wind farm. However, if one begins including the cost of mitigating the harm caused by coal power generation (pollution of water resources through mining, respiratory tract infections in towns close to the coal plant, productivity lost to sick days, etc.) into its pricing, one may find that the price per energy unit generated increases substantially. When this is not done, inevitably these 'hidden' costs are borne by humans or the ecosystem, even if far removed spatially or in time (i.e. generations yet unborn).

Attaching a financial cost to natural resources or services makes their depletion more easily felt by economic actors, leading the actors to conserve them (Kaggwa et al 2013:14). It should also drive innovation, as the economic actors will seek to improve their efficiencies and decrease their costs in other ways (UNEP 2011a:23).

Monitoring and analysis

Correctly valuing natural resources means that states, business and society at large should acquire the ability to monitor and analyse the functioning of natural resources and services according to standardised metrics, determine the thresholds for their safe use, and substitute behaviour towards using technology that is better for the environment (UNEP 2011a:19). On a macro-economic scale,

progress towards a green economy should be measured by appropriate indicators. Gross Domestic Product, for example, is in fact a poor measure of progress to this goal, as it does not measure how economic progress may draw down natural capital – and may in fact obscure imminent economic failure as a result of environmental disaster (UNEP 2011a:23).

VIII. Sectoral approach

Approaching innovation to greener industry is perhaps more valuable from a sectoral perspective, as it allows a systemic understanding of where improvement is needed or possible, and discoveries may be more easily generalized across the sector (Parto et al 2007:13). The ILO sees the following sectors as critical for the green economy for their potential to increase employment or improve sustainability:

- Agriculture, as the largest employer worldwide, especially as a high proportion of these workers are poor, rural or subsistence farmers, meaning gains in this area could have significant benefits in terms of improving food security, poverty alleviation, and decrease urban migration.
- Forestry is a critical sector that has suffered greatly from unsustainable practices. Improvements here could significantly boost environmental services, conservation and renewable materials.
- Fisheries sector faces high job losses due to overfishing. Allowing fish stocks to recover and creating a sustainable system of harvest would ensure sustainability of the industry and food production into the future.
- Energy -- improvements in renewable energy technology, energy efficiencies, and improved access to energy potentially could have large environmental benefits as well as improve employment. Conversely, carbon-based energy generation may see job losses, meaning that governments will need to ensure that workers are able to transition easily away from conventional generation into renewables.
- The recycling industry could form a significant part of the green economy, both in improving resource efficiencies and in increasing employment.
- Green buildings that are energy and resource efficient have great potential for reducing resource use and greenhouse gasses. Retrofitting old building and building new ones creates significant potential for employment growth, but will need a properly trained workforce.
- Transport sector produces high levels of emissions. Greening this sector, moving to mass transportation forms and energy-efficient vehicles could significantly reduce emissions and result in employment gains.

(ILO 2012:3-4)

3.4.3 Summary

This section examined the concepts that underlie the green economy as proposed by much of the international literature. These were shown to be: a regime of top-down governance to take the lead in directing the green economy transition, a privileging of the city as the prime nexus of the transition, a relatively uncritical continuation of conventional approaches to market logic, an emphasis on technological solutions, a renewed interest in the management of natural resources as assets, and the targeting of specific sectors for change.

3.5 Chapter Summary

This chapter reviewed what the international literature has to say about the green economy. It began with a description of the background of the green economy, tracing how the productivity gains of the Industrial Revolution led to escalating environmental externalities, and how green economic theory grew out of an recognition that economic activity needs to be brought in line with an agenda of sustainability in order to ensure the continued flourishing of human life and the environment. The green economy is but one of the many possibilities that has been put forward as a solution. Its attractiveness to policy makers lies in that it promises a transition to cleaner and healthier modes of industrial production without major deviations from the established practices of conventional economics.

The second section dealt with international definitions of the green economy. While there is no universally agreed up definition, broadly the green economy is agreed to be an economic system that takes into account the interplay between economy, environment and society – it is an attempt to address climate change, environmental degradation, and social problems through sustainable economic growth. Implied as well is the idea that government will play a crucial role in leading, funding and facilitating the change. Death (2014) was used to highlight the various emphases that dialogues on the green economy have been shown to take:

- Green revolution
- Green transformation
- Green growth
- Green resilience

The chapter concluded with the development of a Transition Framework. The Transition Framework is an analytic overview of the high-level conceptual foci of the international literature describing the transition from a polluting, harmful, conventional economy towards a green, sustainable one. This Framework aids the user in evaluating real-world green economic transitions (such as the one underway in Cape Town) against the international literature, and identify points of divergence/difference. The Framework has the following elements or foci:

I. Government-led approach
II. Urban and spatial focus
III. Infrastructure-driven
IV. Conventional economics
V. Employment and education are interlinked
VI. Innovation- and technology-driven
VII. Focus on management of natural capital
VIII. Sectoral approach

CHAPTER 4: REVIEW OF THE CAPE TOWN GREEN ECONOMY

4.1 Chapter Introduction

The following chapter looks at the City of Cape Town as a case study for the implementation of the green economy. This case study will be examined through the framework laid out in chapter 3. Firstly, it will begin by examining the background to the green economy in the context of the city. This will be done by a brief overview of the socio-economic conditions of Cape Town. It will then turn to an examination of the local componentry of the Cape green economy – how it is defined, and how it fits within the Transition Framework outlined in chapter 3 above. This last section will also critique whether the green economy is appropriate for the city.

4.2 Background

4.2.1 Introduction

This section will provide an overview of the socio-economic information pertaining to the city of Cape Town, and discuss how that has given rise to the concept of the green economy.

4.2.2 Overview of Cape Town's economy, society and environment

4.2.2.1 Economic policy and strategy

Cape Town takes its lead from the national government, which has had a series of wide-ranging approaches to economic policy in the 20 years since the advent of democracy. The focus from 1994 was predominantly on rebuilding the economy and the improvement of equality via wealth redistribution and the insistence of more equal economic outcomes. The *Reconstruction and Development Programme (RDP)* was emblematic of this economic strategy. This was replaced in a short time however with a far stronger focus on attracting investors, improving economic growth, with the expectation that economic benefits 'trickle-down' to the poor, with the *Growth, Employment and Redistribution (GEAR) Strategy* being perhaps the strongest and most wide-reaching articulation of this school of economic thought. Despite fair growth during this period, unemployment actually grew, as the labour force expanded and the economy showed a tendency to decouple its growth from labour-absorbing industry. GEAR was followed in 2006 by the *Accelerated and Shared Growth Initiative for South Africa (ASGISA)*, which attempted to shift focus back to employment and the other social issues, despite maintaining the market-focus of GEAR. Under ASGISA a broad approach to revitalising industry and manufacturing was begun in the *National Industrial Policy Framework (NIPF)* (2007), which developed through a series of editions and culminated in the *Industrial Policy Action Plan (IPAP).* Chief foci are: fostering technological development, improvement of industrial capability, improving the South African trade balance via diversification and expansion of exports. Levers for this revitalisation included incentivisation of investment, for example through the creation of Special Economic Zones, areas set aside for targeted industries which enjoy specialised legal, business, financial, systems and other forms of support not available elsewhere (CoCT 2014:101).The 2010 *New Growth Path (NGP)* represents the latest shift in economic policy, towards making employment creation South Africa's primary macro-economic objective. The NGP focuses on employment creation, the rejuvenation of the

manufacturing sector, the stimulation of value-added exports, and the development of infrastructure as a necessity for improved productivity. Specific targets are aimed at by the NGP, primarily the creation of 5 million new jobs by 2020, as a result of economic growth of 5-7% per annum from today (CoCT 2014:100).

4.2.2.2 Economic outlook

Cape Town's economic growth rate averaged 3.3% from 2006-2012, ahead of a country average of 2.8%. The city's real GDP per capita stands at R58 844, far ahead of the national amount of R37 404, and slightly outperforming the metro average of R 55 167. However, the growth rate of the city's real GDP per capita between 1996 and 2012 was 1.3%, behind that of the metro average of 1.56% (CoCT 2014:103). The GDP of South Africa for the first quarter of 2015 was R 3 050 billion, of which the Western Cape accounted for R 418 billion, and the City around R200 billion (CoCT 2011:3; CoCT 2015a:6).

The Economist's Intelligence Unit's (EIU) city competitiveness ranking puts Cape Town in 73rd place, the second most competitive city on the continent, just behind Johannesburg (in 67th position). Cape Town scores particularly well in the ranking due to its performance in human capital and institutional effectiveness, which includes fiscal autonomy, rule of law and electoral processes. Other areas in which Cape Town maintains a leading edge are the fact that it is home to both the second-busiest container port and airport in the country, its effective public transport network, financial institution and business clusters, large amount of higher learning institutes, natural beauty and agricultural hinterland (CoCT 2014:19-20,95,97-99). The financial and business services sector is the city's largest, contributing 36% to its Gross Value Add. The city has comparative advantages (compared to the rest of South Africa) in fishing, clothing and textiles, wooden and furniture product manufacture, electronics, furniture and hospitality (CoCT 2014: 103).

Cape Town would seem to have a fairly positive growth outlook for the future, at least in comparison to other African cities. Unfortunately, the city suffers from the subdued performance of the country as a whole since the global recession, being ranked by the EIU at 102 out of 120 cities measured by economic strength (CoCT 2014: 99). Although the country's economy grew at a rate of 4.5% between 2002 and 2008, since the recession growth has performed very poorly and is in fact below the African average. South Africa's GDP growth rate was 1.5% in 2014 and contracted by 1.3% in the second quarter of 2015, and is unlikely to grow at more than 1% for 2016. (Trading Economics 2015a, 2015b).

4.2.2.3 Sectors

Cape Town's economy differs slightly from the rest of the country in having relatively smaller agricultural and mining sectors, and relatively larger tertiary sector (finance and insurance). It has comparative advantages in the sectors of fishing, clothing, wood products, electronics, furniture, accommodation, finance and business services. Since 1996 the city economy has shifted away from productive sectors (agriculture, mining, and manufacturing) and towards the more service-orientated sectors (construction, trade, finance, transport, logistics and business services). The sectors that contributed most to economic growth between 1996 and 2012 were: finance and insurance (31.9%), business activities (8.9%), telecommunications (8.7%), retail trade and repairs (7.1%), and wholesale trade (5.1%), all in the tertiary sector (CoCT 2014a:104-106).

4.2.2.4 Demographic information

Cape Town is the 10th largest city in Africa in terms of population size, its population growing from roughly 2.56 million to 3.74 million people between 1996 and 2011, and currently sits at around 3 957 798. Much of this population increase is the result of in-migration of people from outside of the province. The city currently contains around 64% of the total number of people living in the Western Cape, and is expected to grow to a population of 4.2 million by 2022, and 4.6 million by 2032. The number of households nearly doubled between 1996 and 2011, rising from 653 085 to 1 068 572 – an indication that the average number of people in a household has also shrunk. This has significant implications in terms of resource use, competition for available land, and extension of basic services (CoCT 2014:14-15,18; CoCT 2011:3; CoCT 2015b:7).

4.2.2.5 Poverty and inequality

Inequality is a major problem for South Africa, and Cape Town, while performing marginally better than the rest of the country, still suffers from this issue. The Gini Coefficient fell from 0.6 in 2001 to 0.57 in 2010, but increased up to 0.67 in 2011/12 again. Inequality continues to show strong racial and spatial characteristics in the city. From 2003 to 2013, the number of indigent households – that is, households that earn less than R3500/month – increased from 250 000 to 288 703. It should be highlighted that in Cape Town, contrary to many developing cities, poor households struggle more with income poverty than with lack of access to basic services (CoCT 2014:17). For example, UN-Habitat's City Prosperity Index provides a multi-dimensional perspective on urban human well-being and thriving, examining such factors as economic productivity, operational and planning capability, innovation and entrepreneurial capacity, civil society participation, infrastructure, services, health, recreation, safety, education, natural assets, along with poverty and inequality measures. Out of the 20 cities surveyed by the Prosperity Index on the African continent, Cape Town leads the pack as the most conducive to prosperity, ahead of Monrovia, Conarky, Antananarivo, Bamako, Niamey, Lusaka, Dar es Salaam, Harare, Dakar, Addis Ababa, Accra, Lagos, Kampala, Abidjan, Yaoundé, Nairobi, Casablanca, Cairo, and Johannesburg. However, Cape Town itself only ranks as 41st on a list of 72, behind such cities as Amman, Almaty, São Paolo, Guadalajara, and Helsinki (UN-Habitat 2013: xii, 146-147).

The city suffers from a high degree of exclusion, a result of vast economic inequality. Many groups of people are excluded from economic and cultural involvement, which exacerbated by the legacy of racially-segregated apartheid spatial design, an issue which has not significantly changed in the 20 years of democracy. This is aggravated by the sprawling form of the city and its overtaxed public transport, water and sanitation systems, leading to a lack of social cohesion, and an unstable social environment (Lawhon 2013:11).

4.2.2.6 Employment

Of the 5 230 139 unemployed people in South Africa, 415 997 live in Cape Town, around 7.95% of the total (CoCT 2015b:7). The economically active population (ages 15-64) currently stands at around 69.7% , but the absorption of labour by the economy has fallen from 53.94% in 1996 to 49.7% in 2011 – which reveals that population growth is outstripping the ability of the economy to produce new jobs (CoCT 2014:14-15,18). From 2005-2013 the growth in employment (strongly driven by the finance and business, retail and wholesale trade, and community services sectors) was 2.4%, while GDP growth was 3.7%. This seems to indicate that each unit of labour was responsible for an average increase in output, suggesting that capital intensity and labour productivity were improving.

However, while employment grew slightly during this period, the amount of new entrants to the labour force outpaced it, leading to an increase in the strict unemployment rate from 19.2% (2005) to 24.9% (2013). This is a fairly unsurprising statistic, given that the period included the global financial crisis which affected the South African economy badly. In particular, the manufacturing sector experienced large job losses over the same period, averaging -0.8% per annum (CoCT 2014:107-109). It should be noted that Cape Town is endowed with sectors whose economic performance is not linked strongly to their amount of labour participants, i.e. financial services and IT. Thus, the finance sector may experience vast economic growth in a given year, while not actually absorbing significant amounts of new employees.

"In the decade prior to 2012 an estimated 50 000 people arrived in Cape Town annually (CoCT, 2012) with the expectation of finding employment. It is an expectation that the local economy has been unable to meet. On the contrary the deficit between the types of skills required by Cape Town's private sector economy and the skills possessed by a growing cohort of young people in the city, has created a category of the local population that are referred to (damningly) as "unemployable" – victims of the structural disconnects between economic growth and labour absorption." (Lawhon 2013:40)

Informal sector

The informal sector plays a critical role in employment within the city, absorbing around 9-11% of the workforce. In particular, barriers to entering it are also lower than those of the formal: regulatory compliance, state monitoring, taxation are often avoided, businesses are often home-based and localised, and entrants do not require the high level of skills needed in the more formalised sectors. This means the sector reduces operating costs, improves the financial inclusion of the impoverished, provides low-cost goods and services to the public, and sustains households. However, it also means that participants in the informal sector can avoid contributing to city tax income. The informal sector played an important role during the global recession, where it declined by only 1.5% compared to the 3.5% deterioration of the formal sector, indicating that it can actually reduce the vulnerability of the poor to such shocks. Traditionally however, the government has tended to treat the informal sector as something to increasingly regulate, however, there seems to be a shift to a more developmental attitude: seeing it as an important source of labour absorption and factor for improving the financial resilience of the poor. Problematically, the size of the informal sector in Cape Town (as well as the rest of South Africa) is particularly small in comparison to countries in the rest of Africa – Tanzania's comprises 52% of non-agricultural employment, while Zambia's is 65% (CoCT 2014: 110, 125-126).

Entrepreneurship

South Africa has strikingly low levels of entrepreneurship. The country has an early-stage entrepreneurship level (percentage of adults involved in a business less than 3.5 years old) of 6.97% in 2014 (down from 10.6% in 2013, a 13 year high) compared to a BRICS average of 14%. This is also far behind early-stage entrepreneurship rates in other African countries: Angola (32%), Botswana (28%), Ghana (36%), Malawi (36%), Nigeria (35%) and Zambia (41%), and a regional average of 28%. Furthermore, the country has the highest business failure rate compared to seven other emerging economies (Brazil, Chile, Colombia, Malaysia, India, Russia, Georgia) (Herrington, Kew & Kew 2012:53; Dludla 2015). Speculation on the low rates of entrepreneurship tend to highlight poor levels of education, lack of skills, restrictive and constraining regulations, onerous labour laws,

labour unrest, little government support, fear of failure, and high levels of crime and corruption (Businesstech 2015; Dludla 2015).

4.2.2.7 Crime

Crime is a particular issue for the city. Drug-related crime is at roughly 1 500 incidents per 100 000, nearly triple that of the country average. The murder rate is 51/100 000 for the city ahead of the provincial rate of 44, and national of 31 (2012/13 statistics). Crime shows a strong geographical component, often being concentrated in the poorer parts of the city like Nyanga, Gugulethu, Mitchell's Plain, and Elsies River, although the CBD has very high statistics for common robbery, perhaps reflecting the increased likelihood that victims will report crime (CoCT 2014:18, 58; Meerkat Data Management 2015). Alarmingly, a recent report found that the poorest and most crime-ridden parts of the city had the most understaffed police stations (Knoetze 2014). National statistics for aggravated robberies (robberies where violence or its threat is used) stands at 225.3 incidents per 100 000 (2013/14) (Africa Check 2015). Crime plays a major part in the economics of the city, acting as a disincentive to attracting new business to the city, as well as a deterrent and drain on existing businesses, as it reduces the ability of businesses to enjoy their earnings and conduct their activities in a safe manner.

4.2.2.8 Energy mix and climate change

The economy of South Africa falls short of the UNEP definition of the green economy (low carbon, resource efficient, socially inclusive) with its high dependence on coal-generated electricity, huge extractives sector, and the highest levels of social and economic inequality worldwide. In 2010, South Africa emitted 9.2 tonnes of carbon per capita, significantly more than the other BRICS nations: India 1.7, Brazil 2.2, China 6.2, putting it ahead even of the UK (7.9) (Death 2014:2). The country is heavily reliant on fossil fuels for its electricity, 91% of power in the country being generated by coal (CoCT, SEA 2015:11). South Africa was the 12th largest carbon dioxide emitter in the world in 2011, despite only having the 28th largest GDP (the World Bank Group 2015a, 2015b), and will shortly have the third and fourth largest coal power stations in the Southern Hemisphere when Medupi and Kusile power stations come online fully (Eskom 2016a; Eskom 2016b). South Africa is rated 128th worst out of 131 countries on the 2012 Yale Environmental Performance Index (Death 2014:9), and Sasol's massive Secunda synthetic fuels facility, is also often cited as the largest point source emitter of CO_2 in the world (Yeld 2011).

Cape Town's total energy consumption (2012) was 158 6685 055 gigajoules, predominantly comprised of sources like petrol (31%), grid electricity (29%), diesel (22%), jet fuel (6%), coal (3%), with other sources (LPG, paraffin, furnace oil) taking up 2 to 1%. All liquid fuels are imported, whereas grid electricity is derived from coal (91%), nuclear (4%), and renewables (5%). Consumption is dominated by the transport sector (64%), commercial (13%), residential (12%) and industry (8%) (CoCT, Sustainable Energy Africa 2015:11).

Cape Town produced greenhouse gas emissions in 2012 equivalent to 21 282 238 tCO_2e[5], roughly 5.5 tCO_2e per capita. This is less than Ethekwini (7.3), Tshwane (5.7), and Johannesburg (5.7), but higher than the other metros in the country: Ekurhuleni (5.5), Nelson Mandela Bay (4.5), Buffalo City (4) and Manguang (2.9). Ethekwini's high tCO_2e reflects the fact that the municipality is capturing data

[5] Tons of equivalent carbon dioxide. Greenhouse gasses such as methane, perfluorocarbons, and nitrous oxide have varying effects on global warming. This measure equivalences their effect to that of carbon dioxide.

not collected by other metros, indicating that Cape Town may be underestimating its emissions (SEA 2015:33,120). It is worth noting that while Cape Town's emissions may appear lower than other metros and the country as a whole (which in 2011 stood at 9.3 tCO_2 per capita, excluding other GHGs (the World Bank 2015c)) this may in actual fact indicate variant data collection methods, the fact that carbon embodied in products (e.g. cement) used in the city are not accounted for, or that heavy polluters in the hinterland are not included in metro calculations. The fact remains that South Africa has unsustainable levels of carbon emissions and bears a responsibility to decrease them, having committed to reducing GHG emissions by 34% in 2020 and 42% in 2025 in line with its commitments to the Copenhagen Accord. Failure to meet these commitments would exclude the country from significant amounts of climate aid funding (Borel-Saladin & Turok 2013b:1). Cape Town, as one of the major metros, will have to play a part in this.

The City and province also have a particular interest in acting towards mitigating climate change. The province depends to a fair extent on agricultural production, making it particularly vulnerable to climate change and water stress. The city in particular has large areas that are flat and low-lying. Anticipated climate-driven sea level rise and flood events represent a serious threat towards livelihoods and public health (CoCT 2016a).

4.2.2.9 Further issues

A legacy of underinvestment has resulted in infrastructure that is nearing its peak capacity and end of life, and many areas of the province face significant under-provision. The province's severely stressed natural assets are included into the WCG infrastructure network. The national government has however pledged to invest R 827 billion in the country's infrastructure over the next 3 years (WCG 2013:40).

Lawhon notes a further set of long-standing issues:

- Rapid pace of urbanisation and consequently an increasing need to both extend services to new users , as well as the need to maintain existing infrastructure
- High levels of unemployment, particularly youth, as well as serious skills shortages
- A need to balance the conservation of the environment against the need for developable land
- Preparing for the consequences of climate change, and securing a sustainable future for the city's water, energy and food.
- The local economy needs to both expand, as well as become more diverse, in order to provide an increasing number of employment opportunities for the burgeoning populace.
- Land needs to be provided and serviced for the growing low income settlements, in an affordable way.
- Public transport needs to be improved for the needs of those without access to private means of transport.
- Social and commercial facilities in poorer neighbourhoods need private and public sector investment directed their way.
- Ensure that Cape Town continues to grow as both a safe and a clean city,
- Contain urban sprawl.
- Conserve the natural environment, as well as places of cultural value.

- Basic sewerage and sanitation services are a critical factor affecting both the environment and the social fabric of the city. These need to be addressed in a sustainable and just manner.

(Lawhon 2013:11-12)

South Africa as a country has enormous challenges regarding resource constraints, especially water and land. These in turn, have resulted in large scale unemployment, poverty and inequality, leading to low-quality livelihoods which are exacerbated by climate change. Water, energy and food security are becoming increasingly significant issues, and they too, are intensified by climate change. Key issues to address:

- Improving the administrative, institutional and governance capacities
- Improved coordination to create efficient resource use in the development sectors
- Funding for a transition to a green economy
- Improve communication and information management, dissemination and education
- Mainstreaming green economy principles across sectors

(AFRICEGE n.d.:17-18)

4.2.3 Summary

This section presented the myriad challenges that face Cape Town: a populous city that is growing both in terms of population and household size, that suffers from high levels of inequality, poverty, crime and unemployment. The city (and country) are also heavily dependent on fossil fuels and are responsible for a large proportion of global emissions. Furthermore, South Africa's reduced economic performance and low employment rates present critical issues for government to address at all levels, including the metro.

4.3 Definition and Vision

4.3.1 Introduction

How is the green economy in Cape Town defined and envisioned? The following section will attempt to answer this question by looking at the term's framing from the national government on downwards to the metro government.

4.3.2 Defining the green economy in Cape Town: National, Provincial and Local descriptions

Department of Environmental Affairs definition

South Africa has tended to prefer a green economy vision similar to that of UNEP, probably as a result of the fact that the South African National Department of Environmental Affairs has worked closely with them in developing its strategies (WCG 2015:10). The Department of Environmental Affairs defines a green economy as a *"'system of economic activities related to the production, distribution and consumption of goods and services that result in improved human well-being over the long term, while not exposing future generations to significant environmental risks or ecological scarcities'…[implying] the decoupling of resource use and environmental impacts from economic growth. It is characterized by substantially increased investment in green sectors, supported by enabling policy reforms. The Green Economy refers to two inter-linked developmental outcomes for the South African economy: Growing economic activity (which leads to investment, jobs and competitiveness) in the green industry sector, [and a] shift in the economy as a whole towards cleaner industries and sectors,"* (SAGOV DEA 2015) noting also that *"government alone cannot manage and fund a just transition to a green economy, that the private sector and civil society must play a fundamental role."* (ibid.)

Western Cape Government definition

The Western Cape Government takes its cue from the UNEP definition of the green economy, as used by the Department of Environmental Affairs, and explicitly quoting it in its Green Economy report: *"[a green economy is] an economy that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities"* (WCG 2015:4, quoting UNEP 2010:5).

The Western Cape Government clarifies what it means 'green economy' and 'green growth' to be, as follows: *"The green economy has two components. On the one hand, it is about mitigating environmental risks and increasing the efficiency of the economy, as we know it, in existing economic sectors. On the other hand, the green economy focuses on new economic activities, new businesses, jobs, skills and industries that protect and enhance natural systems and resources, and capitalise on the value generated by natural systems… Green growth is a component of the green economy which places more emphasis on economic efficiency and environmental protection. While projects that drive green growth can have significant social co-benefits, it should be seen as only a sub-component of the broader green economy."* (WCG 2015:4). This represents a shift in emphasis from protecting the environment to capitalising on the environment.

Within the Western Cape, the *OneCape2040 Agenda for Joint Action on Economic Development* (developed by the City of Cape Town, Western Cape Economic Development Partnership and other

stakeholders) provides long-term strategic vision and direction for a transition to the green economy. The overall vision is summed up as making the Western Cape *"[a] highly skilled, innovation-driven, resource efficient, connected, high-opportunity and collaborative society."* (CoCT 2012b:6) In particular, in its ecological transition goal, "Green Cape," it highlights a desire to become a *"recognised leader and innovator in the Green Economy"* via incentivising *"Innovation and the fast tracking of the green agenda"* (CoCT 2012b:8). Particular attention is paid to leveraging public sector spending to create demand for green products, incentivising private sector investment, changing consumption patterns, improving resource efficiencies, and reducing waste. It suggests progress could be measured by the relative level of water and energy security, carbon footprints, and numbers of innovations that reduce resource usage (City of Cape 2012b:23,25).

City of Cape Town

The City of Cape Town has adopted a definition of the green economy based on that of UNEP's *Towards a Green Economy Report*: *"a green economy is low-carbon, resource efficient, and socially inclusive. In a green economy, growth in income and employment are driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services. These investments need to be catalysed and supported by targeted public expenditure, policy reforms and regulation changes. The development path should maintain, enhance and, where necessary, rebuild natural capital as a critical economic asset and as a source of public benefits"* (UNEP 2011a:16; WCG 2015:38). It emphasises outcomes that address employment creation, the reduction of environmental risk, and identifying new economic opportunities. The City sees itself as playing a central role in:

- Attracting investment through incentivisation, and a beneficial planning and regulatory environment;
- The creation of economic opportunities to build on and develop competitive advantages, especially in eco-tourism and renewable energy;
- Using green procurement, green building, and efficiency technologies to stimulate the growth of businesses;
- Making sure that infrastructure is both green and climate-resilient;
- Using the Expanded Public Works Programme (EPWP) to create jobs, expand services, and conserve the environment.

(WCG 2015:38). This vision is of interest, as it represents a shift from that of national government above – rather than seeing the green economy as something produced via collaborative partnership between government, business and society, the City foregrounds its role in leading the green economy.

The City of Cape Town has a well-articulated position on climate change, seeing it both as the major challenge of our generation, as well as an opportunity to produce a better future. It sees the issue as both global, and cross-cutting along domestic government, business and civil society. It sees climate change as not limited to the environment, but also affecting the economy, and society, as well as the country's development future. Addressing climate change is seen as best done by focussing on clean and renewable energy and the creation of a green economy and jobs, as well as the facilitation of a more compact city. This will lead to a more resource-efficient, equitable and liveable city, and environmental sustainability (CoCT 2011:54).

4.3.3 Goals of the domestic green economy

The call for South Africa to transition to a green economy aims to connect and solve two problems in particular that are afflicting the nation: very high levels of unemployment, and an economy that is extremely carbon intensive (Borel-Saladin & Turok 2013b:1). One of *the New Growth Path's* key aims is to direct growth towards labour-absorbing[6] industries to create 5 million new jobs by 2020. It has highlighted the green economy as one of six priority areas because of its potential to create jobs. In line with this, the 2011 *Green Economy Accord* between business, labour, government and civil society aims to create a minimum of 300 000 jobs by 2020 (Borel-Saladin & Turok 2013b:1). These would be jobs in renewable energy generation, energy and resource efficiency, transport, industrial efficiency, emissions and pollution mitigation, sustainable waste management, water management and natural resource management (SAGOV DEA 2015; Maia et al, 2011: vi-vii, 2-3).

Job growth in the green economy is to be instituted by deliberately steering the economy towards labour intensive and green industries through targeted investment. For example, the Industrial Development Corporation aims to invest R22 billion in green sectors between 2013 and 2018 (Borel-Saladin & Turok 2013b:1). Such stimuli are expected to contribute towards creating, in the short (2011-2012) term, 98 000 new direct jobs in the green economy, 255 000 in the medium (2013-2017) term, and roughly 462 000 in the long term (2018-2025). Natural resource management (e.g. public works programs and beneficiation of products generated by them, payments for ecosystem services) is expected to generate nearly 50% of these jobs, while green energy generation (biofuels, waste-to-energy, solar power, wind power) is predicted to fill 28% of the long term employment figure. Energy and resource efficiency activities (integrated public transport, solar-heated geysers, green buildings (including retrofitting), industrial) will contribute 15% of new jobs in the long term, and emissions and pollution mitigation (recycling, electric vehicles, lithium-ion batteries, carbon capture and storage, pollution control) is anticipated to contribute around 7% (Maia et al, 2011: 3-8). These predictions were made in 2011, and while there has been some development across these sectors, no subsequent cross-cutting survey has been produced to discover if these jobs have materialized.

The government hopes to accelerate growth to 6-7 % in order to address unemployment and poverty, however this is likely to increase pressures on the environment, hence the need for a concomitant improvement in the protection of natural capital (Im et al 2011:viii).

Reform is important in several areas: trade policy tends to protect capital and energy intensive sectors – reforms would improve efficiencies and job growth, and reduce emissions. At the same time, South Africa is not a particularly conducive country for small and medium enterprise (SME), which are usually primary employers in medium-income countries. This is particularly due to shortages of skills, crime, uncertain electricity supply, and our particular labour market institutions (Im et al 2011:viii).

In South Africa, climate change and biodiversity loss were also explicitly recognized as reasons for the push to a green economy transition at the 2010 Green Economy Summit. It was recognised that functioning ecosystems are critical for the proper functioning of all economic and social activity, and

[6] Industries whose productivity increases as more units of labour (workers) are added. In contrast to industries that are automating: where productivity increases relate to the productivity of machinery used rather than worker numbers.

that their failure would compromised the country's future, even in the short term (South African Government 2010:60; Kaggwa et al 2013:6). The green economy, by linking economic growth, environmental health, and social equality as areas that can be addressed simultaneously, promises to be the best way of addressing the country's woes.

4.3.4 Dialogue emphasis

Death (2014) notes that the predominant framing of the 'green economy' in South Africa positions it within his emphasis of 'green growth' – that is, its *raison d'être* is to spin up economic growth through the creation and exploitation of new green markets. Less important would be conceptions of the green economy that privilege the survival of the natural world over the economy, or growth as a means to social and environmental justice, or ones that see the green economy as simply a move to improve climate and economic resiliencies. Technology is also a critical part of this vision: innovation is prioritized in order to produce new economic opportunities, and expand South Africa's portion of the new renewable energy technology markets (Death 2014:11-13). As much as it is the case for South Africa, it would seem that Cape Town is also pursuing a 'green growth' emphasis (perhaps even more strongly) by foregrounding the creation of new market opportunities and environmental capitalisation.

4.3.5 Summary

Broadly, South Africa, the Western Cape, and the City of Cape Town define the green economy as per UNEP's description: "*a green economy is low-carbon, resource efficient, and socially inclusive"* (UNEP 2011a:16). Nationally, there is a strong focus on the social aspects of the green economy, interlinking economic growth and the production of new employment opportunities, and shifting the economy to cleaner processes. Provincially, the Western Cape government adds in descriptions relating to the creation of innovation and new economic activity: new businesses, new industries, and new jobs are touted. There is an extension in dialogue from the idea of *protecting* the environment towards *capitalising* on environmental benefits. The City of Cape Town, developing on the provincial vision, centralises the role of metro government in facilitating new economic activity – chiefly through: the attraction of investment, the creation of competitive advantages through creating and exploiting economic opportunities, altering its own processes (e.g. procurement) to stimulate green economic activity, the EPWP, and ensuring that infrastructure is resilient and green. The Cape Town (and provincial) green economy fits within Death's (2014) dialogue emphasis of "green growth" – its rationale is primarily the creation and exploitation of new green markets.

4.4 Transition Policy Documents

4.4.1 Introduction

This section provides an overview of the various government literature affecting the green economy in Cape Town. The documents are arranged according to the hierarchy of their originating level of government. The hierarchy of documents follows their normal governmental order: strategy/framework/vision, policy, and planning. Green agencies and reports are included for emphasis.

4.4.2 National level

Framework for Environmental and Fiscal Reform and Framework for South Africa's Response to the International Economic Crisis

Nationally, strategic direction for the green economy has come from the National Treasury's *Framework for Environmental and Fiscal Reform* (2006) which set principles for the implementation of environmental taxes and levies, on light bulbs, ecosystem restoration, fuel, and vehicle and electricity generation emissions (Montmasson-Clair 2012:7). The global financial crisis prompted the creation of the *Framework for South Africa's Response to the International Economic Crisis* in 2009, formulated by a meeting of NEDLAC, labour, business. This aimed to incentivise investment in green jobs and has triggered large amount of investment in green industry, including R120 billion in renewable energy and R 100 billion in public transport (SAGOV DEA 2015, Montmasson-Clair 2012:9).

New Growth Path

The above Frameworks has been bolstered by the Economic Development Department's 2010 *New Growth Path* (NGP) development vision. Conceived as a response to the economic recession globally and poor job growth domestically, it aims to generate 5 million new jobs in labour-intensive industries by 2020. It identifies the green economy specifically as an area of job creation and inclusion, estimating that it could create around 400 000 jobs in such areas as recycling, green buildings, biofuels, and energy efficiency (SAGOV DEA 2015; WCG 2015:13; Montmasson-Clair 2012:8). In step with the NGP, the Industrial Development Corporation plans to invest R22 billion (around a quarter of its total funding) between 2013-2018 in industries that focus on cleaner energy generation and efficiencies, cleaner production, waste mitigation and reduction, and biofuels, in line with the country's greenhouse gas commitments under the Copenhagen Accord[7] (Borel-Saladin & Turok 2013b:1).

Medium-Term Strategic Framework 2009-2014

The National Planning Commission's *Medium-Term Strategic Framework 2009-2014* of 2009 which defines strategic objectives and goals of government over 5 years, also focusses on several green economy issues. In particular, it relates sustainable livelihoods and resource management to other policy arenas such as power, water, technology, and competitiveness. Policy responses have resulted, including the Department of Environmental Affairs' 2011 *National Strategy for Sustainable Development 2011-2014* (NSSD1) and *National Climate Change Response Policy* (NCCRP) (Montmasson-Clair 2012:8).

National Strategy for Sustainable Development 2011-2014

The *National Strategy for Sustainable Development 2011-2014* (NSSD1) identifies "Towards the Green Economy" as one of its 5 priority areas, describing it as "a *just transition towards a resource-efficient, low-carbon and pro-employment growth path"* (SAGOV DEA 2011:25). Focus areas are to include: resource and water conservation and management; sustainable waste practices; environmental sustainability through behaviour change programmes and greening projects; sustainable transport; green built environment and infrastructure; clean and efficient energy; sustainable consumption and production; as well as sustainable agriculture and forestry. These goals are to be enable via supporting the regulatory framework; green economy programmes; the implementation of skills development programmes, particularly regarding youth and green economy sector/industries; the promotion of innovation and technology; the creation of investment opportunities and corresponding financial instruments; the creation and protection of jobs; and

[7] See "4.2.2.8 Energy mix and climate change" above

implementation of the *Industrial Policy Action Plan* (SAGOV DEA 2011:24). Unfortunately the NSSD1 assigns no budgets, responsibilities or timelines (WCG 2015:21; Montmasson-Clair 2012:8).

National Climate Change Response Policy

The *National Climate Change Response Policy* (NCCRP) presents the government's vision responding to the threat of climate change, as well as the transition to a resilient and low-carbon economy, by improving the country's overall resilience and taking steps to mitigate GHG emissions. In terms of mitigation, the Paper specifies that the country's approach will be to: quantify its emissions, sets commitments on their limitation, require companies and sectors to plan for emissions reductions, deploy a range of economic instruments in support of mitigation, and create a national GHG data collection, monitoring and evaluation system. The NCCRP lays out a suite of Flagship Programmes to pilot interventions into sustainability. A section of the NCCRP is devoted to job creation – specifically, ensuring that job losses are confined to the most unsustainable parts of the economy and that labour is sufficiently mobile to transition out of them into cleaner sectors, and promoting the expansion of green sectors. The Paper also specifies that all levels of government will need to ensure that their policies, strategies, regulations, etc. are fully aligned with the injunctions of the NCCRP within two years, and that, more broadly, all sectors of the country will be involved in mainstreaming climate-resilient and sustainable development (SAGOV DEA 2011b:5-7; WCG 2015:13; Montmasson-Clair 2012:8).

Innovation Plan and Integrated Resource Plan

On the planning front, transition to the green economy is supported by several documents, nationally. The Department of Science and Technology's 2008 *Innovation Plan* prioritises clean, reliable and affordable energy, as well as action on climate change. The Department of Energy's 2011 *Integrated Resource Plan* also supports greener energy, setting a limit on electricity emissions to 275 MT pa, and specifying that 42% of all new electricity generation to come from renewables in the next 20 years. Progress has been made on supporting R&D in electric vehicles, fuel cells, carbon capture, but cancellation of large-scale nuclear energy projects and delays in renewable energy demonstration projects has been something of a setback to these plans (Montmasson-Clair 2012:7-8).

National Development Plan

The National Planning Commission's 2011 *National Development Plan* (NDP) aims to improve living standards through focussing on: increased employment through faster economic growth, higher incomes through growth in productivity, quality public services, and the introduction of a social wage. Human development is to be increased through high quality education and skills development, and the state's developmental role in society is highlighted. Public infrastructure spending is seen as a key enabler of private investment and is set to increase. The NDP provides ambitious and measurable goals relating to carbon and power to be reached by 2030, including: the introduction of carbon budgeting and pricing, aiming to have GHG emissions peak in 2025, incentivisation of energy efficiency and waste reduction, rolling out 5 million solar water heaters, the setting of emission standards for vehicles and green buildings, cross-society resource efficiency, and the procurement of 20 000 MW of renewable energy. The green economy is conceived as a means of promoting deeper industrialisation, and increasing employment and energy efficiency. There has been some progress: taxes on vehicle emissions and green building regulations have been put into place, procurement of renewable energy has started, and roughly 200 000 solar geysers have been

installed. Funding for the green economy between 2009-13 has included: $30 million on the Green Fund, $40 million on green economy projects, and $86 million[8] on green infrastructure. Unfortunately, GHG emissions may already exceed the planned peak levels of 2025, and the solar water heater roll-out is significantly behind schedule (Kaggwa et al, 2013:10; CoCT 2014:101-102; WCG 2015:13; Montmasson-Clair 2012:9).

Industrial Policy Action Plans

The Department of Trade and Industry's *Industrial Policy Action Plans* (IPAPs) (of 2010, 2011, and 2012) support the state, developing sector-specific incentives for areas seen as strategic, such as the green economy. They promote green industry, especially solar water heaters. Other sectors touched on include renewable energy sources, electric vehicles and organic farming. Progress thus far has been the installation by 2012 of 200 000 solar water heaters, and the implementation of a R 120 billion procurement process for renewable energy generation (WCG 2015:14; Montmasson-Clair 2012:8).

Perhaps the most important result of planning has been the *Renewable Energy Independent Power Producer Procurement (REIPPP) Programme*. As a response to chronic national energy shortages, the programme was instituted, allowing independent power producers to feed (renewable) energy back into the grid. At launch, the programme aimed to reach 3 725 MW. Currently 421.82 MW of energy is produced from renewables, of which roughly a quarter is fed into the national grid. The Western Cape has attracted a large amount of investment towards this project (WCG 2015:14).

Reports relating to the green economy

Several reports on the green economy in the country have been produced. Two of the most significant ones are the OECD's 2013 *Environmental Performance Review for South Africa* (EPRSA) and the Department of Environmental Affairs' 2011 *South African Green Economy Modelling Report* (SAGEM). SAGEM modelled various green economy scenarios against business-as-usual practices, finding that a fundamental issue for sustained growth would be natural resource management and environmental protection. Investment in energy sector infrastructure and agriculture were shown to have the highest potential to create jobs (WCG 2015: 12). The EPRSA, on the other hand, took a more policy-driven approach, recommending that South Africa rationalise the carbon economy by implementing a carbon tax and reducing subsidies for electricity and coal consumption. Financing and incentives should also be rationalised to promote investment in infrastructure, goods and services relating to climate-change and the environment, and integrated public transport should be expanded, especially as part of urban planning policies. Finally, eco-innovation should be comprehensively promoted both from the supply and demand sides (WCG 2015:11).

4.4.3 Provincial level

OneCape2040

In 2012, the Western Cape Government released its *OneCape2040* vision document (CoCT 2016c). This is a deliberate endeavour to create a transition towards an inclusive and resilient economic future for the province, emphasizing present action and priorities rather than comprehensive future planning (CoCT & WCG 2012b:2-3). It highlights the central internal challenge facing South Africa and the Cape: the need to transform both the nature and performance of the economy to produce

[8] Reference for this figure is from Kaggwa et al, 2013:10, which quotes it as $86 *billion*, a figure so extremely high it is likely to be a typing mistake.

sustainable growth, environmental resilience, and social inclusion. It acknowledges that a key problem is social exclusion resulting from large-scale unemployment and an economy which is shedding jobs. It suggests that a major issue is that the skills of the workforce are fundamentally mismatched against the needs of the economy, requiring a major change in the quality of education and training. *OneCape* explicitly links these issues as a threat to social cohesion as they will tend to deepen exclusion, inequality, crime and despair (CoCT & WCG 2012b:5).

OneCape's vision for the Cape is summarized as *"a highly-skilled, innovation-driven, resource-efficient, connected, high opportunity and collaborative society"* (CoCT & WCG 2012b:6), and envisions that this can be achieved by undergoing six transitions by 2040:

- A knowledge transition to universal, high-quality education and innovation capacity;
- An economic access transition to an economy that is innovative, productive, and entrepreneurial;
- An ecological transition to sustainable service access, low-carbon resource use, and a green economy;
- A cultural transition to a connected and global market;
- A settlement transition to healthy, liveable communities with access to opportunities;
- An institutional transition to open, collaborative, socially responsible leadership.

(CoCT & WCG 2012b:6-8)

These transitions are to be enabled by:

- Enhancing the regulatory environment, through reducing red tape, improving departmental alignment, incentivising the green agenda.
- Developing key elements of the region's infrastructure, such as: public transport, low-carbon energy generation, water infrastructure, digital connectivity, ports and freight routes, projects which unlock trade opportunities and tourism, as well as knowledge infrastructure, open and collaborative institutions, and employment intermediation infrastructure.
- Creating funding and investment strategies to unlock resources and drive change.
- A geo-spatial approach that concentrates and compacts urban activity into nodes, and ensures that they are connected effectively digitally, logistically and by transport.
- Supportive infrastructure such as an economic databank, clear indicators that include provincial wellness and competitiveness, economic research capacity, leadership development, and improved institutional relationships.
- Indicators to measure progress against transition goals. Relating to the green economy, these would be: employment levels, productivity, entrepreneurship levels, GDP and business growth, carbon footprints, and reductions in resource use.

(CoCT & WCG 2012b:18-25)

Provincial Strategic Plan 2014-2019

Strategic planning and goals are expressed in the *Western Cape Government Provincial Strategic Plan 2014-2019*, which is developed from the national *Medium Term Strategic Framework 2014-2019*. Provincial Strategic Goals (PSGs) guide work over the term of the Plan (WCG 2015:15).

The green economy falls under PSG 1: "Create opportunities for growth and jobs", which is a response to the challenges of high unemployment, skills mismatches, infrastructure deficiencies,

poverty, energy insecurity, poor transport infrastructure, and barriers to doing business. PSG 1 has three priority areas:

a. Make it easier to do business in the Western Cape.
b. Boost the competitiveness of the Western Cape's economy.
c. Promote the regional economy.

Priority b in particular relates to the green economy, and suggests 3 prongs to boost competitiveness:

i) Improve appropriate skills,
ii) Enable entrepreneurs and small businesses to flourish,
iii) Ensure economic and environmental sustainability. 3 focus areas for the green economy are posited under this last point:
- water conservation and demand management
- greening industry and services
- energy security (especially from gas and renewable sources)

(WCG 2015: 16-17)

The green economy also falls under PSG 4: "Enable a resilient, sustainable, quality and inclusive living environment", which deals with how urban and rural settlements respond to climate change, as well as how ecological resources and agriculture are managed (WCG 2015: 16).

'Green is Smart' Green Economy Strategy Framework

The Western Cape Government's work in the green economy is guided by the 2013 *Green is Smart Green Economy Strategy Framework*. Its core ambition is to ensure that the Western Cape becomes both the lowest carbon province in the country and the preeminent green economic hub of Africa. The framework is developed around the following principles: Market-focus, driven via private sector enterprise and entrepreneurship, but enabled by the public sector (particularly in creating market demand through green procurement). Collaboration and partnership-building across actors in the economic, environmental and social spheres is highlighted, and economic inclusiveness is a critical element (WCG 2013:8). It seeks to improve growth in the following areas: diversification of economic activity and development of the service sector, improving the international competitiveness of the agricultural sector, greening the built environment, leveraging ICT infrastructure for its green advantages, and supporting local knowledge development and capability (WCG 2015:17).

The framework operates via the following logic: 5 'Smart' Drivers (driven by the private sector and aimed at particular markets) are supported by 5 Enablers, which are either the responsibility of government or a result of a public-private collaboration. Within each Driver and Enabler are a set of Priorities: areas, actions or sectors that are seen as key for delivering on economic growth, improving environmental sustainability and improving the lives of the poor. Priorities are aimed at causing the Western Cape to either become a pioneer or an early adopter of a particular practice (WCG 2013:8). *Green is Smart* also proposes broad actions needed to achieve the Priorities. The following table maps Priorities within each Driver and Enabler:

Table 5: *Green is Smart* Drivers and Enablers matched to Priorities and Actions (WCG 2013)

Driver	Priorities	Actions needed to achieve Priority
Smart Living and Working	**Smart Settlements:** improved living conditions for the poor.	Incentivise development of solutions for settlements, release government land towards this use, streamline enabling regulation, and export settlement design offerings to African continent.
	Smart Resource Management Systems: produce innovation in ICT suited to emerging markets and resource efficiency.	Support and promote innovation, procure local technologies, integrate systems-thinking into problem-solving.
	Major-User Resource Efficiency: provincial and City of Cape Town government to be leaders in promotion of resource efficiency.	Improve access to capital, remove regulatory hurdles, and develop procurement markets.
	Towards Zero Waste: grow employment in the commercial waste sector.	Identify valuable wastes for recycling, review regulations, and create a provincial waste-exchange (see WISP).
Smart Mobility	**New Generation Hydrogen and Fuel Cell Technologies:** especially those that beneficiate platinum group metals. Includes vehicles, and storage devices.	Collaborate with researchers to identify and expand markets, and showcase innovations, globally and locally.
	Smart Mobility Systems: ICT systems to improve public transport efficiency and responsiveness.	Smooth collaborative opportunities between transport industry and ICT sector, fund and pilot smart systems, shift freight transport from road to rail, integrate mini-bus taxis into Integrated Rapid Transport system (IRT) via ICT systems.
	Alternative Fuel and Hybrid Technologies: for public transport and freight.	Develop policy and regulation for the use of alternative/hybrid infrastructure, identify market opportunities. WCG to lead adoption.
	Bicycles and Electric Bikes: central to planning transport in small towns.	Support R&D, provide financial support for infrastructure, and develop markets for bicycle manufacture, sales, and repairs.
Smart Eco-systems	**Ecosystem Research and Education:** for the support of livelihoods and growth of the biomedical industry.	Investigate beneficiation opportunities for local flora in partnership with research institutes, develop markets, extend protected marine areas.
	Infrastructure and Jobs: ecosystem services to be seen as opportunity for low-skilled employment.	Attract financing to ecosystem infrastructure via partnerships and policy, fund environmental public works programmes (PWPs), and develop markets from PWP interventions.
	Responsible Tourism: for job and economic growth creation.	Collaborate with tourist industry and Wesgro to create a knowledge platform and run awareness programmes, develop industry standards and bodies. A 'responsible tourism' marketing platform is to be created.
	Sustainable Mariculture: expand opportunities for marine resource utilization.	WCG is to develop a framework for removing barriers and expanding mariculture prospects, and support and collaborate with businesses on market

		development. WCG also to continue with harbour development programmes.
Smart Agri-production	**Sustainable Farming Practices:** reduce resource intensity and carbon footprints to protect and grow markets.	Develop short, sustainable value chains in collaboration with retailers and farmers. Research methods for sustainable farming, create knowledge sharing partnerships, and grow markets for sustainable products through increased consumer awareness.
	Farming in Harmony With Nature: use biodiversity for new farming opportunities.	Develop agricultural biodiversity programmes, develop partnerships between stakeholders in affected sectors, and identify a showcase pilot project.
	Smart Technologies: to reduce water and carbon footprints.	Enable ICT innovation, especially smart sensors, through targeted interventions. Enhance take-up of financial support for using ICT in agriculture.
	Waste as Commercial Resource: identify opportunities for the use of agricultural waste.	Link cost of waste removal to volume generated. Create markets for and enable regulation to ease the creation of waste-to-energy schemes.
Smart Enterprise	**Integrated Framework of Measures:** to enable green investment.	Streamline regulations, focus on the spatial location of green investment as a benefit, and provide specialised financial support – see Finance Enabler.
	Public And Private Procurement: to drive green investment and job growth.	Develop guidelines and pilot projects to back green procurement – and thus create business and job growth.
Enabler	**Priorities**	**Actions needed to achieve Priority**
Infrastructure	**Greenfield Natural Gas Infrastructure:** improve SA's and the WC's energy sector.	Invest in infrastructure, enabling technology development opportunities for universities and businesses. Lobby for increased proportion of natural gas in national energy mix. Facilitate lobbying and collaboration across government departments, agencies, and other bodies. Obtain national and regulatory approvals to enable market development.
	Concentrated Solar Power: centre manufacturing and services in Western Cape.	Lobby for pilot SA-designed CSP project. Establish potential of CSP manufacturing and services as part of programme to secure investment for renewable energy in the province.
	Integrated Water Management Model: to protect scarce water resources.	Berg River Improvement Plan is to be run as pilot for testing technologies, planning, institutions, overall integration and management of partnerships.

Rules and regulations	**Voluntary Carbon Offset Drive:** provincial government to head up drive by paying for its carbon emissions.	110%Green pilot aims to develop WCG carbon trading mechanism and thus incentivise energy efficiency measures as carbon offsets. Promote local carbon trading, with credits benefitting WC community organisations.
	Green Procurement: a public-private initiative supporting green products and service investments.	Develop green procurement guide across sectors for WC region, develop best-practice policy guide, create pilot projects in key sectors, and use procurement to support business and employment growth.
	Seamless Government Interface: integrated processing of compliance regulations for green investment.	Reduce transaction costs for green investment through single interface which the private sector can use to engage all three levels of government. Enable systems for improved cooperation between levels of government.
Knowledge and Innovation	**Innovator Network:** use smart system to network researchers, entrepreneurs, and investors for the WC and the emerging market.	WCG to facilitate development of an innovation network targeting Africa and other emerging markets, use smart system to connect network, link to virtual green knowledge hub.
	Economy Indicators: create green indicator set for Western Cape Competitiveness Index.	Adapt global indicators for local use, develop data collection systems, and ensure common indicators and data sets across projects.
Capabilities	**Skills Programmes:** create suitable skills programmes for skills needed in water, waste, and renewable energy sectors.	Create platform for collaboration between public, private and education sector to enable information sharing on skills gaps. Access funding for targeted training initiatives. Partner with international training institutions to develop new sets of skills. E-learning to be a key component. Public, tertiary and private sector sharing of green economy research agendas to be facilitated by WCG.
	Leadership Platform: cross-sector collaboration for green growth.	Cultivate collaboration and develop leadership. Grow green leadership skills programmes across all sectors of society.
Finance	**Financial Framework:** develop mechanisms for supporting investment in green growth, such as that arising from Smart Enterprise and the public and private sectors.	Research financial mechanisms that will support Smart Enterprises. In particular, look at filling gaps, as well as dealing with the risks and opportunities of the new green economy. Improve coordination, knowledge-sharing and collaborative activities through the use of the WCG green economy working group's financial platform.

4.4.4 Metro-level

Energy and climate change strategy

In 2006, Cape Town rolled out its *Energy and Climate Change Strategy* (ECCS), the first city on the African continent to produce such a plan (CoCT 2016a). This acknowledged the heavy reliance of the

city on fossil fuels, and pictures a more sustainable energy future which would include: fossil fuel reduction and replacement with cleaner sources like natural gas, greater use of renewable energy, improved energy and resource efficiency, and cleaner public transport. It also explicitly states that a sustainable society is underpinned by affordable and safe energy *(*CoCT 2006:14). The document outlines five visions for the city's energy future: universal access that is safe and affordable, energy use that is sustainable and efficient, a transport sector that is efficient and inclusive, and where city energy use supports the economy and employment (CoCT 2006:20-21). The ECCS lays out an energy strategy with specific sectoral targets to 2010. Energy is seen as the critical area in supporting sustainability in the sectors of transport, commercial & industrial, residential, government, and energy supply. Specific goals include: operational non-motorised transport system by 2015; 10-12% increases in energy efficiency in industrial, commercial residential and government buildings; roll-out of solar water heaters and efficient lighting; retrofitting subsidised housing with ceilings; connection of all households to electricity; 10% supply of energy from renewables by 2020; CO^2 emissions reduced by 10% in 2010 over 2005 levels (CoCT 2006:47).

City Development Strategy

In line with *OneCape2040* and the NDP, the City of Cape Town released its 2012 *City Development Strategy* (CDS), both a strategy document and action plan to alter the city's development path (CoCT 2012b:3).The document envisages the next 30 years, and describes the key levers for creating social cohesion and economic opportunity. It is supported by the *Economic Growth Strategy* (EGS), *Social Development Strategy* (SDS) and the *Integrated Development Plan* (IDP) (CoCT 2016c). The CDS aligns *OneCape2040* and IDP transition focus areas with its own goals and sub-goals. Relating to the green economy, CDS goals are as follows:

- CDS Goal 4: produce an inclusive and resilient city economy by:
    - Creating an entrepreneurial and innovation-friendly metro
    - Being a year-round place for tourism, sports and events
    - Making the creative industry a global player
    - 'Optimising the oceans': explore offshore natural gas potential, improve ports and harbours, develop aquaculture and mariculture
    - Use competitive advantages to produce services for Africa, for example in: the blue economy, creative industries, agro-processing
- CDS Goal 6: inspire an eco-friendly city by:
    - Making it a global centre for R&D in the green and blue economies
    - Focussing on food, energy, and water resource management

(CoCT 2012b:6)

Interventions for the 2012/13 year were to: create a strategy to deal with state-owned enterprises in relation to urban development, specifically the use of redundant land; employ the Expanded Public Works Programme; and commence scoping, feasibility and research studies into the metro's food, water and energy resilience (CoCT 2012b:6).

Economic Growth Strategy

The City of Cape Town's 2013 *Economic Growth Strategy* aims to decouple local economic performance from that of the country as a whole as much as possible, in particular it is targeting the finance and investment sectors through making the city something of an investment 'one-stop-shop', provision of investment incentives and modernisation of the regulatory environment. A

spatial/geographic approach is also taken to improve the city's competitive advantages by creating business or sector clusters, and facilitating partnerships between businesses and government (CoCT 2014: 99).

Integrated Metropolitan Environmental Policy

The City of Cape Town's 2003 *Integrated Metropolitan Environmental Policy* (IMEP) is the basis for a series of strategies and programmes ensuring that the norms of sustainability are followed in Cape Town's context as a city in a developing nation. The IMEP is a statement of intent at the local government level which recognises the importance of the environment in the context of the need for social and economic development and contains an environmental vision to the year 2020. It is intended to serve as a leadership pledge for committing to general policy principles towards the sustainable development of Cape Town by the various arms of local government. Of particular interest are commitments to *"the protection of the constitutional right to a healthy environment and the recognition of the responsibilities and obligations of sustainable service delivery and ecologically sustainable development… ensuring that best practice environmental solutions and activities are implemented at all times … applying the precautionary principle, which states that if environmental consequences of a proposed activity are of significant impact and/or concern, and are uncertain, that activity should not be undertaken*" (CoCT 2003:6). Regarding the economy, it notes: "*"A commitment to the recognition that the environment of the City of Cape Town is its greatest asset and that sustainable development requires economic growth, the creation of jobs and the reduction of currently high levels of poverty in the City of Cape Town. This includes a commitment to: Recognising the interdependence of economic development, poverty and environment; Supporting economic development strategies and initiatives that promote global competitiveness, provide jobs, reduce poverty and improve living and business environments."* (CoCT 2003:13).

The IMEP is a high-level vision document, providing general principles rather than practical steps and projects (Lawhon 2013:14). For example, it suggests adopting the following principles:

- Acceptance of Local Agenda 21 principles
- Environmental monitoring using suitable sustainability indicators
- Life cycle cost accounting in analysis of alternative solutions
  Environmental education, development of guidelines, and requiring adherence to them (CoCT 2003:8)

It also notes that the city is likely to be required to meet emission targets in the future. It explicitly recognises the importance of energy for development, as well as the fact that energy production has serious environmental and social externalities. IMEP therefore promotes a universal consideration of energy efficiency, commitments to reduce fossil fuel use, and the promotion of renewable and clean energy (CoCT 2016a).

The IMEP was updated in 2009 as the *Revised IMEP Environmental Agenda 2009-2014*, one of the main divergences from its predecessor being the positioning of Cape Town as part of a developing nation, rather than a generic international city. It has a particular focus on individual action, while the responsibility of the state tends to be focussed on protection of biodiversity (Lawhon 2013:15).

Energy and Climate Change Action Plan

The City of Cape Town currently runs around 40 programmes made up of 120 different projects relating to energy, climate change, and the green economy (CoCT 2011:3; CoCT 2016a). These are coordinated via the 2011 *Energy and Climate Change Action Plan*, which prioritises them according to the following agendas and criteria:

- Low carbon: energy efficiency, renewable energy, public transport, city compaction
- Economic development: local energy business development, job creation
- Poverty alleviation: improved health/wellness, better access to urban goods
- City resilience: lowered risks, localisation

(CoCT 2011:3)

To meet these agendas, the City has implemented 11 objectives to which the various projects and programmes are assigned (see Appendix B). The objectives essentially are aimed at reducing electricity consumption, increasing city energy supply from renewables, creating a more compact and efficient city, climate adaption and resilience, enablement of economic development in the energy sector, accessing climate finance, behavioural change, and R&D and monitoring and evaluation (CoCT 2011:45-49).

5 year Integrated Development Plan

The City of Cape Town's annually revised 5 year *Integrated Development Plan* (IDP) arose out of the recognition that apartheid had left Cape Town with a highly segregated spatial form, and an understanding that spatial planning has a strong link to social justice and equity. There is an acknowledgement that this spatial segregation has persisted into democracy and has been very challenging to overcome. A major problem in the city however, is that well-located land is extremely expensive. The intention of the IDP plan is to guide development by local government within a framework provided by national government, in order to overcome the legacy of apartheid fragmentation, and a Spatial Development Framework is one part of the IDP (Lawhon 2013:15-16). The IDP is also essentially a way for the City to plan for and set its budget priorities, balancing resources across the metro. Developed in partnership with city residents, the top priorities were identified as jobs, housing, and safety/security, with employment creation being linked to the city's attractiveness to business (in terms of infrastructure, service delivery and administrative ease) (CoCT 2014b). The city has 5 visions on what it should be: a place of opportunity, safe, caring, inclusive, and well-run (CoCT 2013b:ii). Importantly for the green economy, the vision of the "opportunity city" is focused on economic enablement through:

- The creation of multiple levers to attract investment, including leveraging of city assets for development and economic growth
- Encourage development of sectors where the city has a competitive advantage
- Use the city's geographic location as an entry-point to the African market
- The provision of market support through regulation, planning and infrastructure
- Investing in infrastructure
- Developing economic partnerships
- The creation of catalyst projects for growth and sustainability
- Consistent improvement
- Help small businesses and entrepreneurs to grow
- Natural resource conservation

- Urban resilience and adaptation
- Exploit the city's appeal as a creative and educational centre

(CoCT 2013b: 7, 14)

The Opportunity City vision has six objectives, of which the following relate to the green economy:

- Objective 1.1: "*Create an enabling environment to attract investment that generates economic growth and job creation"* (CoCT 2013b:15). Under this objective, the advancement of the green economy is promoted by the city government stimulating demand for green services via its procurement systems, energy sources, as well as the programmes and projects that it initiates (CoCT 2013b:15).
- Objective 1.3: *"Promote a sustainable environment through the efficient utilisation of resources"* (CoCT 2013b:17). Interventions here firstly call for sustainable approaches to the use of natural resources. These include nature conservation, promoting the social function of natural spaces, as well as the utility of ecosystem services. Job creation and skills development are possible opportunities, as well as renewable energy research, and reductions in city waste and energy footprints. Secondly, interventions under this heading also focus on water demand management via conservation, rainwater harvesting, greywater reuse, reuse of effluent, and demand reduction (CoCT 2013b:17).

Green agencies: GreenCape and 110%Green

Of particular import for the City of Cape Town's green economy efforts, are two green agencies run by the provincial government: GreenCape and 110%Green. In support of the *Green is Smart* framework, the WC government is working on enhancing institutional capacity in support of investors and renewable energy developers. GreenCape is the Western Cape government's sector development agency, which aims to open up industrial and employment growth in the province. Key intentions are: to support business development through partnerships, remove regulatory obstructions, make the Cape an attractive place for green investment, communicate information, provide a platform for industry to lobby government, and facilitate renewable energy projects via REIPPP. GreenCape has a particular focus on certain areas, with sector desks for the built environment, renewable energy, waste, and water. It will run projects when needs have been identified by sector units, with a general focus towards job creation, poverty alleviation and resource efficiency (WCG 2015:25-26). GreenCape is WC government funded, but led by industry, to support investors (WCG 2013:6).

110% Green, the green economic communications and critical mass programme of the office of the Western Cape Premier. It is an initiative created by WCG as the public face of the green economy in the Western Cape, and aims to mobilise society towards adoption of the green economy via networking, partnerships and direct action (WCG 2013:6). The initiative intends to catalyse a critical momentum and enthusiasm for the green economy through: the showcasing of green economy initiatives within the province, the bringing together of various players in the space to support each other and commit to environmental goals, and changing perceptions about how government is viewed as an economic and social actor. The *Better Living Challenge*, for example, was an innovation challenge created by *110%Green* to leverage some of the interest around the 2014 World Design Capital event towards projects in the green economy (particularly the built environment) (WCG 2015:26, WCG 2012).

4.4.5 Summary

This section provided an overview of the South African literature space relating to the green economy. It showed how national government has provided the leadership on the green agenda, but that provincial and local government have filled in much of the detail. In terms of priorities, on a national level, while policy does cover many green economy areas like energy and fuel generation and efficiencies, pollution, sustainable agriculture, waste, etc., there is clear prioritisation of job growth running throughout all the strategic, policy and planning literature, as well as a concomitant desire to see an improvement in economic growth. Linked to this is an emphasis on social development through means that include improving public infrastructure, skills development, better living standards, and so on. It is clear that the green economy is seen as facilitative of these goals, rather than simply an end in itself. It may be argued that the green economy in South Africa has thus seen a drift somewhat in conceptual focus of the green economy – that is, its focus has shifted from being a means to counter anthropogenic climate change to being a means to deal with social issues and stimulate some sections of the economy. It is quite clearly viewed as a supplement to the conventional economy, rather than a replacement of it.

On the provincial level, job and economic growth are carried through as priorities, indeed the green economy is a sub-goal within the Provincial Strategic Goal of job and growth creation. There is a strong emphasis on social inclusion being a critical element of this growth. Small businesses and entrepreneurial growth are also prioritised. There is also a much greater focus on the geospatial, economic and public infrastructure characteristics of the province – and sectors like the water, the environment and agriculture are highlighted.

At a metro level, national and provincial priorities are carried through into greater detail, with a very strong focus on the local characteristics of Cape Town. There is a renewed focus on energy and transport, and an effort to decouple the metro economy from that of the rest of the country. There is also a focus on facilitating job and economic growth through catalyst projects, incentivisation, improved administration and red-tape reduction. Life cycle accounting, emissions targeting and the use of renewable energy are promoted for incorporation directly into local government. The green agencies give a particular focus to the built environment, water, waste, renewable energy and green businesses.

Locally, there is certainly a concerted effort, at least on the policy front, to give teeth to the green economy. It would seem too that the province and metro put the green economy more centrally as a means of job and economic growth than is done nationally. This may be partly due to the fact that regional characteristics tend towards economic sectors that are more easily incorporable into the green economy, such as agriculture, mariculture, tourism and financial services. While there have been some effective implementations of these priorities, whether these efforts do result in a well-functioning and competitive green economy is yet to unfold, as many of them have long term pay-offs.

4.5 Transition Framework

4.5.1 Introduction

The following section will apply the Transition Framework created in chapter three to evaluate Cape Town's green economy. This is done to identify (possible) points of divergence between the "idealized" or "abstract" descriptions of the green economy described in international literature, and the real-world implementation of the green economy in an urban, developing-world situation. In identifying points of divergence/difference, a more critical sense of the applicability of high-level theory is likely to arise, as well as the probable reasons for drifting from them. This section therefore applies the framework step-by-step to the Cape Town context. As noted above, the Framework has the following elements or foci:

I. Government-led approach
II. Urban and spatial focus
III. Infrastructure-driven
IV. Conventional economics
V. Employment and education are interlinked
VI. Innovation- and technology-driven
VII. Focus on management of natural capital
VIII. Sectoral approach

4.5.2 Transition Framework: a contextual evaluation of Cape Town

I. Government-led approach

South Africa is something of a global leader in progressing towards putting the concept of the green economy into practice. This can be seen particularly through the prominence of environmental issues in the country's national policy: the discourses arising from the *Rio Declaration* were incorporated into the regulatory and legal enactments of the country via section 24 of the 1996 Constitution *"Everyone has the right to an environment that is not harmful to their health or well-being,"* and the 1998 *National Environmental Management Act*'s preamble: *"sustainable development requires the integration of social, economic and environmental factors in the planning, implementation and evaluation of decisions to ensure that development serves present and future generations."* (Death 2014:4). The country has made large commitments to reducing emissions by 34% (below 'business-as-usual' scenarios) by 2020 and 42% by 2025, a challenging proposition in light of the overwhelming need to grow jobs and the economy, reduce poverty, and keep energy affordable. South Africa has incorporated green discourses into its national branding through its hosting of high-profile sustainability and climate conferences, such as the 2002 *Johannesburg World Summit on Sustainable Development*, *COP17* in 2011, and the 2010 *Green Economy Summit*. The national government has also begun the provision of financing for a green economic transition via the Green Fund and an $0.8 billion stimulus to environment and climate infrastructure in the wake of the 2008 financial crisis (Death 2014:10; Im et al 2011:ix).

The City of Cape Town has also been front-footed in running with the green economy: *"no other province or city in South Africa has more policies on environmental conservation and sustainable resource use than the Western Cape Provincial Government and the City of Cape Town"* (Crane and Swilling (2008), quoted in Lawhon 2013:13). This is partly due to the explicit recognition that climate change is likely to have significant impacts on city infrastructure, livelihoods and health, as well as an

understanding that over-reliance on the ailing public energy utility Eskom may be unwise, as it is becoming more prone to sudden blackouts.

Apart from this, the push for the green economy in Cape Town is also the result of a political regime opening the potential up to deviate from the norm, as described by Späth & Rohracher (2011:475) (see 3.4.2.I above). The Western Cape Province and metro city are the only ones in the country to be run by the opposition party Democratic Alliance (DA). The green economy represents a way for the party to distinguish its brand from that of the ruling African National Congress (ANC), who has murky ties to coal mines and infrastructure manufacturers for coal power generation (Cartwright 2015). For example, Chancellor House, the secretive in-house investment firm for the ANC, effectively owns 25% of Hitachi Power Africa, a major contractor for the Kusile and Medupi coal plants, which are expected to cost R118.5 billion and R 154 billion respectively by the end of construction. President Zuma's son and some of his wealthiest supporters, the Gupta family, have connections to coal mining companies which were found to be operating illegally. When discovered, the government retroactively legalized their actions, a course it has taken with at least 21 of Eskom's other coal suppliers (Welz 2013; Eskom 2016a; Eskom 2016b; Whittles 2015). Successful green energy generation in the Cape would represent a moral victory for clean governance and a step towards independence from a type of generation increasingly associated with the ruling party. If the green economy delivers the jobs it promises, it will show that the DA is able to deliver on one of the most pressing social concerns in the country in a way that the ANC has not.

It is clear from a reading of the policy documents available that Cape Town, and South Africa more widely, has received a large amount of leadership relating to the green economy. In line with much of the international literature, the approach has been top-down, led by government, instead of a "grassroots" agenda driven by civil society and/or business. This gives at least the impression of longevity. Government is certainly the chief financier of the green economy transition, as noted above, the *Framework for South Africa's Response to the International Economic Crisis* resulted in R120 billion towards renewable energy generation, and R100 billion to public transport, while the IDC will be investing some R22 billion as well. It is worth noting the SA government does pursue a policy of public participation during the design of its documents, although it may be questionable how much this actually influences policy. The privileging of job creation as part of the SA green economy, compared to international articulations, certainly indicates a recognition that this is a particularly pressing issue for civil society, and that the government is responding.

The seeming contradiction between the ruling ANC government both promoting policy relating to renewable energy generation, yet simultaneously being deeply wedded to "dirty" technologies, is not as conflicting as it seems at first blush. The ANC is a broad party, containing a multitude of different groups and factions, some of whom are linked to coal and nuclear while others pursue a more progressive agenda. Certainly, recent events around state capture, the controversial trillion-Rand nuclear deal, and the factional in-fighting between those supportive of the Presidency versus those defending the National Treasury have shown just how riven the ANC has become. At the same time, what is clear from much of the literature is that the green economy and renewable energy nexus have mainly been regarded as an addendum to conventional practices in these spaces, rather than something that would present a serious challenge to them. The enthusiastic take-up by the opposition DA as a means of 'brand-differentiation' may have therefore been unanticipated.

In the racialized and class-structured politics of South Africa, it may also be that the DA reflects the ideals and aspirations of particular groups (substantially white, middle- and upper-classes) who are perhaps more concerned with issues of sustainability than the voting base of the ANC, who may be more concerned with job-creation. It would be worth examining what the take-up of the green economy and renewables has been like in cities not controlled by the DA, as a comparison.

II. Urban and spatial focus

From a national policy, strategy and vision perspective, the green economy is not often framed from an urban standpoint explicitly. However, it may be inferred that nationally the urban nexus is seen a critical response area for interventions into human settlements, infrastructure, water management, transport, and the business sectors that it is home to. For example, while the NSSD1 does not specifically address urban centres, it refers to environmentally sustainable urban infrastructure, enhanced spatial planning, improved housing and resilient communities (SAGOV DEA 2011a:26-29), and city-wide public transport (ibid.:32). The National Climate Change Response White Paper highlights the central role urban populations play in responding to climate change (SAGOV DEA 2011b:17), has a section on urban settlements in relation to climate change (ibid.: 21) and the use of market-based instruments to address emissions, power generation, carbon taxes and other financial methods (ibid.: 40-43). The Department of Environmental Affairs notes that "sustainable human settlements and the built environment and green buildings [are] a key sector within the green economy landscape, that is key for addressing the triple challenge of environmental sustainability, social equity and economic development." (AFRICEGE n.d.:7).

However, as one examines Western Cape provincial and Cape Town city government outputs, the urban emphasis does come into sharper focus, evidenced by the many policy and other documents dealing with the green agenda (see section 4.4.4 above), the many green city projects (see Appendix B), and the central role that the city plays in the Province's official green economy strategy, *Green is Smart*. The green economy is also customised for local conditions geo-spatially. On a global geographic perspective, the city's location at the tip of South Africa gives it privileged access to South America, India, China, and many African countries. It has particular access advantages to the gas discoveries offshore of the Western Cape, and more widely, the Mozambican coastline, therefore developing local port infrastructure to service this sector (as well as the Angolan oil fields) is an important part of the city's planning (CoCT 2012a:59). On a more micro level, the spatial layout of the city plays a role in planning: for example, the outlying township and industrial area of Atlantis has been designated as a Special Economic Zone focussing on renewables and green manufacturing. Various policies are being put in place to attract investment to the area—creating positive by-products towards green economy goals by leverages existing infrastructure, as well as ensuring the economic and social sustainability of an often-ignored and economically depressed area (CoCT 2011:48; WCG 2013:35).

III. Infrastructure-driven

Public infrastructure spending is seen by the NDP as a key enabler of private investment. The NDP and IPAP specify that infrastructures such as solar water heaters and renewable energy plants be rolled-out (CoCT 2014:101-102; WCG 2015:13; Montmasson-Clair 2012:9). The city has taken a particular focus on public transport infrastructure as a means of addressing both social upliftment

and reducing emissions. The new Integrated Rapid Transport (IRT) system assists those without means across the sprawling metro to easily commute to job opportunities and work. Improved public transport also means fewer cars on the road for less time, meaning reduced emissions. It should be noted however that the IRT has not yet been rolled out to the very poor parts of the city. Furthermore, it has received serious opposition from the local taxi industry.

Problematically, at a national level, amounts devoted to green infrastructure begins to seem insignificant when compared to spending on 'dirty' infrastructure, such as the nearly R 300 billion that the Kusile and Medupi power plants will cost. A deep capital investment like this tends to shape the future of a country, and the fact that government has tended to ignore or retroactively legalize polluters shows some of the pressures facing adoption of green infrastructure.

IV. Conventional economics

Looking at which sectors grew and which struggled, the conclusion arises that what this period witnessed was the de-industrialisation of the city – the tertiary sector grew while the secondary sector battled. Furthermore, the spectre of labour-growth decoupling arises: some types of tertiary sector GDP growth (particularly in IT and finance) is often not associated with increasing employment, as financial returns are not strongly related to increased labour productivity or job growth, but rather the returns from abstract financial entities, or improved capital-intensity. This means that it is quite possible for a city or state to report improved GDP and per capita growth, yet have large-scale unemployment, as is the case in South Africa. This is problematic. A city in a country with a young, burgeoning population needs to show grow in sectors that absorb labour to avoid unemployment and poverty increasing, and their concomitant social issues. Furthermore, not only are large amounts of the population unemployed, their lack of skills appropriate for the growing tertiary sector tends to ensure that they will remain unemployed. It is therefore important for the city to actively target high-growth and labour-intensive industries for investment, but also ensure that the skills of the labour-force are improved. The manufacturing industry should also be re-looked at as a site for revitalisation, potentially through the creation of strategic infrastructure (CoCT 2014: 111-112).

Much of the criticism levelled at the green economy has been to do with its perpetuation of capitalist growth paradigms and funnelling income to a new set of international players. However, in Cape Town, the green economy may fulfil an important role as a revenue stream for local government. Up until the *Municipal Systems Act* of 2000, local municipalities were predominantly concerned with the technical capacity and provision of services to suburbs already connected to the grid. The Act ambitiously extended the ambit of local government to include the environment, the economy, and the socio-economic well-being of its citizens. For the first time, local government needed to begin thinking about how budgets could be used to shape economic trajectories and the course of development. This context means that local government has been in a process of struggling to find its feet as a developmental structure – continuing to provide services to rate-payers while expanding services to the socially, economically and spatially marginalized. The result is that increasing pressure has been placed on city budgets (Lawhon 2013:39).

The existing economic model is premised on the provision of services to the middle-class, rate-paying electorate, whose taxes are used to cross-subsidise services for the poor. Thus the City's finances are to a large extent dependant on keeping this first group satisfied, meaning that it faces

limitations in how much of the fiscus can go to the poor. (Lawhon 2013:41). By 2012 there was an increasing understanding that the current model of service delivery was no longer workable, particularly in the light of needing to increase services rollout to a burgeoning population over an increasing spatial footprint, while revenues from rates and taxes flattened out, and national funding became more restricted in the wake of the global financial crisis (Lawhon 2013:40). The green economy is touted as a way to address this provocative situation. It will do this by examining new ways of allocating the fiscus, means of cost savings and efficiency improvements, the creation of new revenue streams, and perhaps most importantly, the creation of new economic opportunities and jobs (Lawhon 2013: 40).

Whether this is likely to work, remains to be seen. Indeed, the fact that the city is considerably reliant on electricity sales to fund its fiscus means that it has a significant disincentive to apply certain renewable energy generation schemes, such as home-owners feeding self-generated electricity back into the grid.

V. Employment and education linked

While the literature regarding Cape Town quite explicitly links employment and education, it adds a further rationale: an unemployed populace will suffer from low levels of human development, and this will in turn lead to a variety of social ills, including threatening the stability of society. The South African government acknowledges the role that the equitable aspects of the green economy plays in maintaining the stability of its democracy: *"South Africa aspires to be a sustainable, economically prosperous and self-reliant nation state that safeguards its democracy by meeting the fundamental human needs of its people, by managing its limited ecological resources responsibly for current and future generations, and by advancing efficient and effective integrated planning and governance through national, regional and global collaboration"* (my emphasis, SAGOV DEAT 2008:8). This is something of a nod towards the role that inequality and unemployment have played in feeding instability and even civil war globally in the last two decades, and perhaps an acknowledgement of South Africa's precariously high levels of these social ills.

OneCape2040 posits that key issues in Cape Town are social exclusion resulting from large-scale unemployment and an economy which has decoupled from job growth, as well as a fundamental mismatch between the needs of the economy and the skills of the workforce. These will threaten social stability as they will tend to deepen exclusion, inequality, crime and despair. As solution it advances its "Educating Cape" knowledge transition to universal, high-quality education and innovation capacity (CoCT & WCG 2012b:5-8). Along with OneCape2040, The City of Cape Town's *Economic Growth Strategy* sees two key factors as being critical: firstly, a knowledge transition to create the high-level of education and skills, as well as capability for innovation needed to compete globally. Secondly, an economic access transition to create an innovation- directed, productive and entrepreneurial economy (CoCT 2014: 106).

The strong focus that employment has taken within the local green economy is clearly a result of the emphasis that the NGP has placed on employment-creation being the primary objective of the economy. By 2020, the NGP hopes to have created 5,095,000 new jobs, of which 400 000 jobs will be specifically created in the green economy: 220 000 in construction of sustainable infrastructure, 80 000 in green manufacturing, an unspecific amount in public works projects to protect the environment, and 100 000 in ICT, education, healthcare, pharmaceuticals, biotechnology and mining

technology. Public infrastructure projects in energy (33% renewables and 25% nuclear), transport, water, housing and communications are expected to produce roughly 2.5 million jobs, while small-scale agriculture will produce 300 000 jobs, agricultural processing 145 000, and tourism and business services 250 000 (Nattrass 2011:3). The NGP specifically requires that human development is to be increased through high quality education and skills development (SAGOV DEA 2015; WCG 2015:13; Montmasson-Clair 2012:8-9).

Cape Town's economy is closely linked to international and domestic conditions, when these take a turn for the worse, the Cape Town economy struggles. Therefore, an emphasis of many of the Cape Town economic visions (including that of the green economy) is that innovation and new businesses be encouraged, hopefully producing new industries that would divest the local economy from some of its tracing of national economic conditions. Growing jobs via entrepreneurial activity and competitiveness is part of the *Provincial Strategic Plan 2014-2019*. Apart from insisting on improving skills, it advances that entrepreneurs and small businesses must be acknowledged as critical employers, and should be assisted in flourishing (WCG 2015: 16-17). *OneCape* suggests that a major hurdle here would be the removal of red tape and the provision of incentives (CoCT & WCG 2012b:18-25).

VI. Focus on innovation and technology as drivers

Innovation and technology are important parts of the Cape Town green economy, particularly as part of its competitive edge. Firstly, the city is home to several well-ranked knowledge institutions such as the Universities of Cape Town, Stellenbosch, South Africa (campus), and Western Cape, as well as Cape Peninsula University of Technology and a variety of other colleges and schools. This makes it a particularly attractive place to create linkages between business and innovation institutes, as well as providing a ready stream of trained graduates. The city is also attempting to position itself as a hub for the African natural gas industry, and so technological development is a large part of the local green economy development (CoCT 2012a:36,38). However, it should be noted that in the developed world, progress in technology and innovation is associated with increased mechanisation and automation. In South Africa, and elsewhere in the developing world, the emphasis is very much on labour absorption – innovation simply cannot result in job losses. As a result, innovation is directed towards productivity improvement, as well resource efficiency and decoupling.

Regarding Cape Town being able to leapfrog dirty technologies, unfortunately the city has well-established dependencies on them, particularly with respect to energy generation, because of its reliance on the coal-powered national grid. It is unlikely that the city can leapfrog technology, however it can begin substituting away from them towards renewables, and has done so.

VII. Managing natural capital

As a centre renowned for its natural beauty and with the tourist industry being an important part of the local economy (generating 8% of regional economic activity), it is in the City's interests to protect its natural environment, and its policies do address this. The arid nature of the Cape region, its water insecurity, and its dependencies on the agricultural and fishery sectors make this a crucial area of intervention (WCG 2013:6, 24).

VIII. Sectoral approach

The National Strategy for Sustainable Development highlights the following sectors as important for a sustainable future: resource and water conservation and management; sustainable waste

practices; environmental sustainability through behaviour change programmes and greening projects; sustainable transport; green built environment and infrastructure; clean and efficient energy; sustainable consumption and production; as well as sustainable agriculture and forestry (SAGOV DEA 2011:24). The *Green is Smart* strategy agrees, underlining interventions in fishing, aquaculture, water, agriculture, waste beneficiation, financial and business services, natural gas, the built environment, transport, energy, and the natural environment (WCG 2013). It goes further, listing specific programmes to develop sectors, such as: an energy efficiency endeavour by the city government, a metro Integrated Waste Exchange (IWEX) and provincial Western Cape Industrial Symbiosis Programme (WISP) to allow reuse and exchange of waste materials, educational projects focussing on green issues, the use of satellite technology to monitor water use, the development of the Atlantis Green Manufacturing Hub, green procurement projects for government, and the creation of a training centre dedicated to renewable energy technology (WCG 2013).

4.5.3 Summary

This section analysed the local Cape Town green economy in light of the Transition Framework developed in chapter 3. On the whole, it was discovered that the Cape Town green economy largely mirrors the contents of the international Transition Framework, with some important differences, summarised in the table below:

IX. Government-led approach	The green economy agenda is given leadership by national government, with provincial and local government taking large steps to fill in policy gaps, develop planning and produce successful implementation. Political manoeuvrings also play a role in the impetus towards the green economy – if the DA party ran a successful green economy in its Western Cape powerbase, it would serve to differentiate it from the ruling ANC, which has large interests in mining and coal power electricity generation.
X. Urban and spatial focus	The Cape Town green economy has a definite urban focus, much of the policy, strategy and planning documentation being customised for the city. It has a geographic perspective, locating the city globally as the nexus between centres in the developing world and its proximity to offshore gas resources. Spatially, the green economy is being used to reincorporate a "forgotten" part of the city (Atlantis) back into its economy.
XI. Infrastructure-driven	Infrastructure plays an important role in the greening of Cape Town, particularly in the form of the city's IRT system. The success of green infrastructure may be offset by the deep investments that national government is making in 'dirty' infrastructure, however.
XII. Conventional economics	The growth-focused economics of the green economy are seen as a welcome generator of jobs in the city. Careful planning must be undertaken to ensure that the green economy creates new ways of adding to the city fiscus, rather than harming its tax income.
XIII. Employment and education are interlinked	The City sees employment and education as linked. Facilitating the growth of small businesses and entrepreneurs is seen as critical to growing employment. Education plays a crucial role in ensuring that the labour market is adequately trained to participate in the local economy. Employment and education are expressly linked to social stability and inclusion.

XIV. Innovation- and technology-driven	Innovation and technology are key elements of the city's green strategy, the aim being to leverage local competitive advantages in knowledge-generating institutions.
XV. Focus on management of natural capital	Managing natural capital correctly is part of the City's approach to ensuring the sustainability of important parts of the local economy.
XVI. Sectoral approach	The City has taken a sectoral approach, identifying areas of consolidation and growth. It has also taken steps to begin putting in place institutions that will facilitate the continued success of these sectors.

4.6 Chapter Summary

This chapter applied the structure described in chapter 3 to the city of Cape Town as a case study, in order to understand the design of the local green economy. The first section of the chapter began by giving an overview of the city, describing how the city takes its economic lead from national policy, but currently faces subdued performance. It identified the important economic sectors as being tertiary – particularly finance and insurance, as well as service-orientated sectors. It noted the city faces serious struggles against high levels of poverty and inequality, burgeoning population and household size, a troubling economic outlook, high levels of unemployment, crime, and has significantly dirty sources for its energy requirements. The green economy has been presented a solution for solving the city's issues, predominantly based on two reasons: its promise to reduce emissions, and produce employment opportunities through stimulating growth. Ecosystem protection is also presented as a rationale, though somewhat secondary in nature.

The second section of this chapter presented the way in which the green economy has become defined in Cape Town under the influence of the various levels of government. It found that the City of Cape Town generally follows the UNEP definition: "*a green economy is low-carbon, resource efficient, and socially inclusive"* (UNEP 2011a:16), with a dialogue emphasis according to what Death (2014) terms 'green growth' – it's prime focus is on the creation of economic growth through the development of new green markets. The City has slightly shifted its green economy vision from that of national government to place the onus of leadership of the transition on local metro government (rather than on collaboration between government, business and civil society). A further shift from the national position is the emphasis on capitalising on environmental value rather than purely protecting it.

The third section of the chapter provided an overview of the domestic literature (strategy, policy, planning and other documentation) relating to the Cape Town green economy. It was found that the local green economy is well defined and planned, and that implementation is underway.

The chapter's fourth and final section took the Transition Framework developed in chapter 3 and applied it to the local green economy in order to discover points of divergence between it and the international theoretical position. The local green economy broadly mirrors the international literature, with major differences being:

- The role of local political players in motivating for a green economy to differentiate themselves from the ruling party.

- A spatial-geographical focus, locating the city within its global geographic context, and recognizing how the spatial arrangement of the city can be used to produce co-benefits as the green economy is mainstreamed.
- Capitalising on local competitive advantages in knowledge-generation are key in ensuring the green economy has innovation capacity.
- Green interventions need to be carefully balanced so that they do not harm tax income to the local government.
- The creation of new jobs and the appropriate skilling of the workforce are seen as crucial elements in social stability.

CHAPTER 5: CRITICAL DISCUSSION

5.1 Introduction

This chapter presents an overview of the common critiques against the green economy, in order to highlight some of the challenges facing its adoption in a city like Cape Town. It begins with a description of the general challenges: a dearth of critical research on practice, yet a bewildering amount of policy documentation. This is followed by a critique of the assumptions green economic theory is based upon, and then a discussion of the challenges implementation faces in the developing world.

5.2 General challenges facing the green economy

5.2.1 Producing critical research on the green economy is challenging

Part of the challenge for researchers attempting to analyse the green economy is that there it can be fairly difficult to find critical research on the subject. *"Much of the literature tends to plough the field of conceptual definitions and does not yet pay enough attention to actual green economy practice. Emerging green economy ideas are certainly important in themselves…. However our premise is that prospects for urban sustainability transitions will be determined by how governments are able to digest these ideas within their policies, programmes and projects. To date, research on how green economy thinking fares in public decision-making spaces has been limited."* (Götz & Schäffler 2015:80)

Götz and Schäffler explain this issue in their review of the literature on the subject, distinguishing between three 'generations' of green economy scholarship:

- First generation: defining the green economy, setting norms and standards, building a case for its adoption, and the creation of a policy-toolbox.
- Second generation: reflections on the first generation, distinguishing between the various discursive frameworks, or critiques of green economic theory. Usually theoretical, and does not include studies into implementation.
- Third generation: analysis of implementation, in the interest of discovering and supporting 'best-practice' examples.

According to the authors, very few to none take the form of analyses critical of the green economy or are particularly fine-grained. While there is reflection on the difficulty of implementing green economy ideas, most of this research is at the macro and theoretical level, and very little of the literature deals with it at the city level (Götz & Schäffler 2015:80).

Secondly, in writing this dissertation, the author found that the incredible host of strategy, policy, plans, programmes and projects focussed on the green economy in Cape Town (i.e. in just a single South African city) bewildering to negotiate. This is due to a variety of reasons:

- Activity in the green economy is dealt with by a large range of overlapping documents with different aims, produced by different levels of government and different departments. Departments themselves are occasionally re-arranged to include new portfolios, or divided into new ones, as happened with the former Department of Environmental Affairs and Tourism.
- The documents are produced years apart, cross-reference each other, and are frequently superseded by newer documents.

- Events in the wider environment, for example, government agreeing to build new nuclear plants, have massive ramifications for green policy, yet the guiding documentation may take years to be updated to reflect the fact.
- The hierarchy of individual documents relative to others may be inscrutable.
- Documents are frequently undated, meaning it can require investigation into third-party sources to establish the age of a particular piece of policy.
- Finally, the government document filing systems themselves are not coherent – there is no central document repository, instead departments load their documents onto their own websites, with little attempt at integrating them into the wider policy environment.

This situation results in a great deal of confusion for those attempting to engage with the green economy.

Lawhon (2013) agrees, noting a lack of coherency around the Cape Town's desire to be a global city and its place in the developing world. Policy-makers, and business and social elites have a real desire to put the city on the map as a desirable tourism and business environment – a 'World City'. Indeed significant resources are directed towards this vision. However, the city is also the site of significant inequality and poverty, which gives every appearance of deepening, and there is significant social pressure to make Cape Town a 'Fair City'. It is unclear to what extent either of these two visions complements or contradicts efforts to introduce a green economy (Lawhon 2013:10-11).

5.2.2 Transition is complex

Transitioning to a new economic system is difficult, as the new one has to compete against an existing system that is already fully developed and optimized. Should an innovation or greener practice manifest within the older, dirtier system, it may have the effect of entrenching the old system more and hindering the rollout of the new (Mulder 2007: 253). A dilemma emerges: an unsustainable industrial technology might be improved, but this innovation will not lead to the desired ultimately sustainable state. This is compounded by risk-avoidance behaviour: a breakthrough change is needed, but the incremental improvement is usually less risky and less expensive, at least in the short-term. This therefore raises the need for judgements to take into account perspectives beyond the short-term and purely economic, to include a long-term vision for the future (Mulder 2007:258).

According to some planning scenarios, in order to stabilise atmospheric CO_2 at 450 ppm, the use of fossil fuel will need to drop by 80% by 2050. Reducing the emissions associated with a burgeoning and urbanizing population will require radical changes to society's consumptions patterns, ways of building, transportation, and water and sanitation systems – the technologies that we have relied on for the past century will need to be replaced or altered (UNDESA 2011:viii). This is a fundamentally challenging state of affairs, compared with past technological revolutions. Firstly, the timescale over which it needs to happen is vastly shorter – a matter of 30 or 40 years. Secondly, governments will need to play a central role in fostering the transition due to the speed with which it needs to happen, the large-scale and long-term funding requirements (for research and development, and technology diffusion), the incorporation of a public good (i.e. the environment) into market economics, and the need to facilitate widespread social, technological, political and economic transformation. These challenges cannot be left to market forces to address, and are likely to require extensive government support and incentives, as well as well-directed educational and industrial

policies. Lastly, the threats to climate and environment are global in scale, and therefore this revolution will require extensive international cooperation (UNDESA 2011: ix-x).

Cape Town, and South Africa, more generally, face these complexities in transition. It may be that the city, being led by an opposition party without the strong ties to coal industry the ANC has, will find it less politically challenging to make such a shift. There is also significant political will at the highest levels to shift to a greener path, however, the key issue in this process will be to grow jobs and the economy. Any strategy that does place this centrally will not gain widespread political traction.

5.2.3 The green economy has temporal and spatial intangibility

There is also a significant temporal and spatial component to green economic theory. Temporally, giving up harmful technologies in the short-term, means a more sustainable future in the long-term. Spatially, human activity has consequences across national borders – one country's externalities can cause flooding or pollution in another. Problematically, with some of the expected green economy pay-outs being decades or centuries in the future, or spatially distant and diffused, green policies may face significant political opposition from a domestic scale – people possess different abilities to convey their preferences, and on a domestic scale, the 'intangible' foreigner or the as-yet unborn are likely to have diminished representation. Even economic actors spatially and temporally close to political centres may have unevenly heard voices, and decision-makers themselves are often bound by electoral-cycles and the need to maintain their popularity. It is therefore expected that green economic policies are likely to only be pursued when they do not disadvantage powerful lobby groups (Resnick et al 2012:218). Green economic policies face the same challenges in implementation therefore that any other policy does, but with the added disadvantage that its proposed benefits may be even more intangible than the norm.

Part of Cape Town's natural advantage is that it is not tied heavily to highly pollutive industries, thus activities in the green economy have generally resulted in new sectors being created, and businesses making technological transitions, rather than closing down. Indeed, many of the green economy activities (such as Working for Water/Fire) have created more employment. The city is still very connected to the national economy and energy generation regimes however, and therefore changes to those sectors will have local knock-on effects.

5.3 Validity of green economy theory

5.3.1 Perpetuation of the failures of conventional economics

"If we can move towards a green economy without undermining economic growth, it will make a difficult task much easier. If the claim in the UNEP report is correct, we can continue to enjoy an ever-increasing output and consumption of goods and services, while improving social equity and reducing impacts on the environment. But can we?" (Victor & Jackson 2012:11)

Kosoy et al (2012: 74) point out that many contemporary debates on the green economy unfortunately ignore that the assumptions on which it is based perpetuate the current economic model, and as such, will undermine a sustainable future. These underpinnings have been forgotten, in the rush to adopt the green economy. They believe that the many of the debates around the green economy suffer from the following:

- Its purposes are not well conceived.

- The role of managing consumption demand is underemphasized.
- Its assumptions about reality are contrary to science.
- Its focus on measurement ignores the fact that economies are dependent on living within the constraints of the biosphere.
- It applies a set of economic logics laid down in the 18th century (and not significantly altered since) to the contemporary green economy (Kosoy 2012:78).

Borel-Saladin & Turok (2013a:215) note "*The question at the heart of the green economy is whether it is possible to correct environmental degradation and social inequality through… the very system that gave rise to these problems."* The system here being the continued pursuit of the fundamentals of the industrial economy (capitalism, technology, government regulation, and market-driven mechanisms) that gave rise to these issues. The idea that the economy must continue to grow, that human-kind deserves a certain, western level of material thriving has passed largely unexamined into green economic policy world-wide. This, perhaps purposeful, naiveté can obscure factors that potentially have more effect on changing climate change. For example, Feng et al (2015) recently reported that the 11% decrease in fossil fuel emissions from 6 023 Mt to 5 377 Mt in the US (2007-2013), normally attributed to a shift from carbon-based electricity production to 'greener' natural gas, was in fact caused by the economic recession, more than the use of cleaner energy. Of the 11% decrease in carbon intensity, less than a fifth could be attributed to the switching to natural gas, the rest was due to economic recession (Feng et al 2015:4). This would indicate that a smarter approach to reducing carbon would be economic de-growth, a de-escalation of industrial activity.

Some of the fundamental selling points of the green economy is that, if properly implemented, will actually outperform the conventional economy, especially in the long term. This growth in economic performance is to be accompanied with regenerated stocks of natural resources for a future that is sustainable in perpetuity, and reductions in environmental threats such as pollutants. However, questions are being raised as to whether these predictions are in fact valid. Victor and Jackson (2012) in fact point out that the models used are problematic – in particular they rely on grossly averaged empirical data sets to make predictions across countries that have large differences, sometimes in orders of magnitude, between geography, climate, wealth, economic output, social equity, etc. (ibid. 11). They note that green economy greenhouse gas reduction targets set by the UN are significantly inadequate compared to the targets required by IPCC scientists in order to reach a climate-stable future and avoid catastrophic climate change (2012:13). The green economy goals of the UN also call for increased investment in the green economy, but do not take into account from whence this money must come, or what will be de-funded as a consequence, or when modelling the input of investment, actually skew the model towards a favourable green economic outcome by directing larger investment amounts to it (ibid. 14). Perhaps most significantly, the authors point out that the UN fails to take into account the difference between the carbon intensity of low and middle income countries versus those of high income. if low and middle income countries continue on their comparatively (compared to high income countries) fast-growth economic route and reach a position of GDP per capita equity similar to those of high income countries by 2050 (as hoped for by green economy equity goals), GHG emissions will increased enormously, simply because these poorer countries have more carbon-intensive economies. This is under the present system of GHG reduction and economic growth targets. To achieve growth-based economic equity in-line with that desired by the UN and GHG reductions actually able to prevent climate change (i.e. the reductions

recommended by the IPCC), global GHG emissions would have to be reduced by 80% over the next 40 years, middle and low income countries would need to grow at a rate of 3.4% and high income countries decrease their growth at a rate of -1.9%, with an average annual reduction of 8.6% in carbon intensity – an improbably ambitious target (ibid. 14). *"[I]t is unlikely that reductions in CO_2 emissions (not to mention other global environmental pressures) and significant closure of the gap between rich and poor (as required by a truly green economy) are simultaneously possible without some curtailment of ambitions for economic growth."* (Victor and Jackson 2012:15).

Assumptions about technology, developmental paths and the economy are not neutral. Pope Francis I: *"Humanity has taken up technology and its development according to an undifferentiated and one-dimensional paradigm. This paradigm exalts the concept of a subject who, using logical and rational procedures, progressively approaches and gains control over an external object. This subject makes every effort to establish the scientific and experimental method, which in itself is already a technique of possession, mastery and transformation. … We have to accept that technological products are not neutral, for they create a framework which ends up conditioning lifestyles and shaping social possibilities along the lines dictated by the interests of certain powerful groups. Decisions which may seem purely instrumental are in reality decisions about the kind of society we want to build."* (Francis 2015: paras 106, 107)

Whitehead (2013) agrees, pointing out that attempts to direct the future of the city are not neutral, rather, they are contingent on the intersection of different regimes of power. Currently the dominant paradigm of most cities is a neo-liberal orientation towards market-orientated governance, private-led and environmental entrepreneurialism. Whitehead notes, in the discourses of urban and national authorities and international agencies, a peculiar linking of climate change and urban competitive advantage, and an emphasizing of socioeconomic benefits (2013:1349). In essence, the story being told is that unbridled capitalism will solve poverty and environmental woes. These are problematic associations, but they are those of neoliberal urban environmentalism – a powerful normative framework. There are *"often-obscured socioeconomic assumptions of urban climate governance regimes. Analyses of the Cities for Climate Protection Campaign have, for example, described the ways in which urban climate policies tend to be transformed into a 'neoliberal buffet of options' in and through which a metropolitan denizen's carbon conduct is regulated through a series of consumer-oriented discourses of cost-savings and economic efficiencies."*(Whitehead 2013: 1351).

Whitehead traces the market-driven underpinnings of current approaches to climate change back to the emergence of Liberal Environmentalism in the 1970s – essentially a compromise between environmental policies and neoliberal orthodoxy. Liberal environmentalism sees neoliberal principles as consistent (or even needed) for protection of the environment, and supports economic growth, privatization, free trade and the use of market-based mechanisms (e.g. carbon credits) as the means of achieving it. Whitehead believes that this agenda has become normalized to the point that it has become largely invisible in debates on climate change (Whitehead 2013:1356). Kahn suggests that neoliberal approaches assume that *"we'll be 'saved' by a multitude of self-interested people armed only with their wits and access to capitalist markets.*" (Kahn in Whitehead 2013: 1358). Such valorisation of self-interest does cast doubt over what we might be handing our urban futures over to. He notes that while research has led to an urban focus on climate change, this is characterised by a lacuna that ignores the role of political players. This may be possibly as a result of

the urgency that characterizes the climate change community (Whitehead 2013:1363). Rather than seeing the urban as a spatial organization of infrastructures and institutions, we should see it as a geographical manifestation of economic, social and political processes and regimes that shape individual cities. This would include property markets, finance flows, political interests, labour, and so on (Whitehead 2013: 1352).

Whitehead notes that climate change policy has been explicitly linked to the creation of international markets trading in commodities and services for climate adaption. In this way a particular neoliberal vision of how cities should adapt to climate change is creating the neoliberal structures needed to accomplish this vision. This is problematic. Firstly because the long time-scales involved with climate change threats mean that it may be difficult to generate the requisite demand for adaptive investment and products(2013: 1363-4). Secondly, because a significant element of our current predicament is the immense focus our society places on consumption. Simply producing a paradigm that spurs further consumption (even of 'green' products, very few of which are completely environmentally neutral) does not make sense.

Neoliberal approaches to adaption have drawn down public funding and has produced a gap in climate responses that is unlikely to be closed. It is therefore very important that the politics of urban adaption are constructed as a process that contests the logic of neoliberal capitalism and urbanism, and its effects on funds, resources and the climate; rather than simply a rush for short-term solutions from any source, that allow elites to exploit the future (Whitehead 2013:1364). For contrast, the Cancun Adaptation Framework takes a much more people-centred approach: *"enhanced action on adaptation should be undertaken in accordance with the convention, should follow a country-driven, gender sensitive, participatory and fully transparent approach, taking into consideration vulnerable groups, communities and eco-systems, and should be based on and guided by the best available science and, as appropriate, traditional and indigenous knowledge. "* (Cancun Adaptation Framework in Whitehead 2013:1357).

5.3.2 Continual growth is not compatible with environmental health

There is no real attempt by proponents of the green economy question the idea that there are limits to growth , indeed, the UN's newly-released Sustainable Development Goals insist on consumption-led GDP growth of at least 7% in least developed countries (Hickel, Kirk, Brewer 2015; UN 2015: target 8.1). Nor is it acknowledged that over-consumption of 'green' products can still cause environmental degradation. *"Nature has been treated as a commodity that exists largely for the benefit of people, and all environmental problems as solvable with a technological fix. "* (UN Secretary General's report to UN on Harmony with Nature in Kosoy et al 2012: 74).

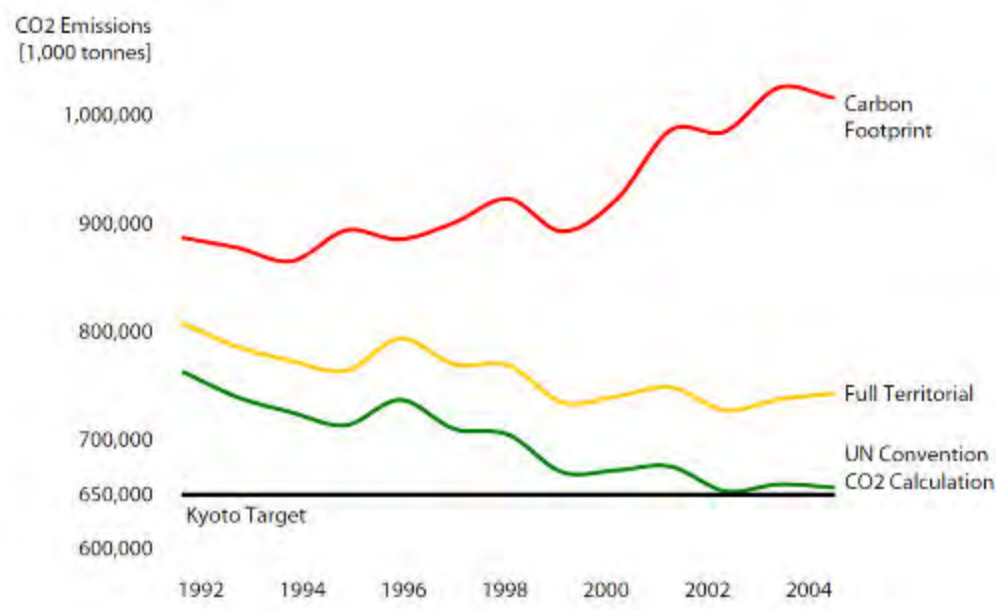
The market-centred approach employed by the green economy raises questions about whether market mechanisms will be able to deliver substantial environmental and social positives, or whether it will simply result in greenwashing. Greener production and making dirty behaviour more expensive are unlikely by themselves to remedy the underlying power structures and information asymmetries that cause persistent inequality and environmental damage. The recently released *UN 2030 Agenda for Sustainable Development: Sustainable Development Goals* continue this persistent belief in market mechanics solving the crises facing the world – indeed, an entire section of the *Agenda* is devoted to the premise that high GDP growth will provide the basis for a transition to a more just, healthy planet (Hickel, Kirk, Brewer 2015; UN 2015).

5.3.3 Technological decoupling is not yet feasible

Beinhocker (2012) notes that in order to both grow the economy and reduce emissions, the productivity of each tonne of carbon employed must rise ten times from a productivity level of $740 per tonne in 2008 to $7300 per tonne by 2050 – a productivity increase of 10 times. Considering it took US labour productivity from 1830 to 1955 (125 years) to achieve the same 10 fold increase, we are now expecting to achieve a similar shift in the space of 42 years (Beinhocker 2012:5, 7). One must seriously question whether it is feasible to expect green economies to decouple productivity from energy use in such a short time, as this places serious expectations on the rate of technological advancement, green energy technology uptake, as well as the consumption patterns of populations. The green economy is also predicated on the idea of increasing economic growth (and presumably material consumption), raising questions about whether decoupling is even within the bounds of the possible.

Furthermore, the spectre of the Jevons' Paradox is raised (mentioned above in section 3.2.3). Without addressing the hyper-consumption that underpins much of growth economics, technological innovation is likely to only worsen the situation (Kosoy et al 2012:75). The figure below shows how UK emissions, while apparently coming in line with international conventions, actually increased as polluters shifted their activities offshore, for example, by moving production to China (Rode 2010:59).

Figure 4: Development of UK CO2 Emissions 1992-2004 (Rode 2010:59)



5.3.4 The green economy may cause job losses

According to the ILO, as the green economy comes online worldwide, it will result in significant changes to employment in particular sectors: agriculture, fishing, forestry, resource-intensive manufacturing, recycling, energy, buildings and transport, which between them employ roughly half of the global workforce, around 1.5 billion people. Unsustainable practices and market forces have already lead to declining jobs in sectors like forestry and resource-intensive manufacturing, but a move to a green economy may accelerate this. Fishing will face job losses, particularly in the short

term, as the industry moves to reduce catches to prevent the collapse of its fish stocks. Carbon-based energy generation will also experience job losses as pressure mounts to move to more sustainable energy generation. It is therefore imperative that international bodies and governments act to ensure that sufficient employment demand is created in the green economy, and that employees are equipped to make the transition. On the positive side of things, it is expected that areas like renewable energy generation, green buildings, agriculture, green manufacturing, transport and the formalisation of the recycling industry will expand their employment capacity as the green economy gathers speed (ILO 2012:3-4). The model also doesn't take into account the effect that these massive reductions would have on industry, or whether growth in green industry would sufficiently compensate for both the loss of employment and economic output (Borel-Saladin & Turok 2013a: 216).

The issue of the winner versus the losers of the green economic transition is generally glossed over, or treated as a theoretical question. The job losses in industries disfavoured by the green economy are likely to be high. Compensating the freshly unemployed is likely to be costly, and will involve considerable efforts at re-skilling and re-training, meaning that government will need to have significant capacity and resources (Borel-Saladin & Turok 2013a:217). These are challenging demands on even developed nations, and it is questionable whether this will be possible in developing nations. *" The quality of [green] jobs is emphasized with a focus on adequate wages, safe working conditions, limited travelling time to and from work (time, money, fuel and emissions) and access to organized labour … As far as green jobs in the developed world are concerned, analyses has focused on factors such as changes in the total number of jobs, underlying job movements from one job category to another (e.g. change in job specifications) and the quality of jobs through the transition to a green economy. There is a lack of this kind of information for developing countries, which poses difficulties for developing effective policy to transition to a green economy.*" (UN-Habitat 2012:10-11)

This is a particularly tricky question in South Africa, with 'dirty' industries (such as mining, power generation and minerals beneficiation) employing large sectors of the work force. Whether the skills in these are transferable to green sectors is uncertain. Indeed, giving the issues that beset the education sector, one must ask whether re-skilling workers for new jobs will be feasible.

5.3.5 Summary

In South Africa, throughout much of government policy, the green economy is presented in a fairly uncritical way. It is very much seen as a subset of the conventional economy – that is, while it may attempt to reform some areas, it is not a major challenge to the status quo and does not really contest the fundamental assumptions of neoliberalism. It should be viewed as the creation of a new set of green businesses and markets under the larger program of creating jobs and economic growth, rather than an ends in itself. It is therefore not a critique of the current model – rather it is simply a new market. Challenges to the economic status quo in South Africa come from a wholly different arena currently – political groups and student activists – who argue against it from a position of structural injustice or racial inequity.

We need to examine to what extent our current commitments to economic growth are orientated with green economy ideals: do they truly create a decoupling from pollution, social deprivation and over-consumption, or do they merely continue to perpetuate current sustainability shortfalls?

Schultz and Bailey (2014) note that concerns about the non-sustainability of growth economics have been raised many times since the 1970s, although their influence has have remained limited. It is only with the significant global financial, climate, and social crises in recent years that the insufficiencies of growth models are being discussed – although predominantly outside of mainstream economic discourse. Mainstream discourses still hold traditional capitalist accumulation and growth models as preeminent (Schultz, Bailey 2014: 280).

How should a sustainable future be embraced? A starting point should be an assessment of what an economy in a flourishing biosphere would look like, rather than bolting on 'green innovations' to a system that is already dragging the ship down. Furthermore, the twin assumptions of green economics: unlimited growth and technological salvation must be exposed for the illusions they are (Kosoy et al 2012:74). What is the economy for? Kosoy et al (2012: 75) note that present definitions of the economy exclude many areas that do not have directly translatable financial value or defy commodification. Furthermore, common goods (clean air and water, healthy soil, etc.) must be protected and enhanced. A regime that relies upon private ownership and short-term return is unlikely to sufficiently act to protect them. Kosoy et al (2012: 76) make an important link between poverty reduction and economic equality. It is not simply a case of raising the poor to some hypothetically acceptable level of consumption and living. Rather, a sustainable economic approach must acknowledge that wealth inequality is a significant cause of status competition – leading to lifestyles of overconsumption.

5.4 The green economy in the developing world

5.4.1 Planning regimes

Broto (2014:257) notes a key risk in planning for a sustainable future in the developing world, is that many such discourses facilitate the intervention of international consultants and planners who have little experience in local contexts. When it comes to climate change planning, the characterisation on the international stage has been one of rapid, top-down action and the forgoing of (usually lengthy) participatory planning processes (Broto 2014:260). This can lead to the application of 'fixes' designed for the first world, which may be completely unsuitable for the developing world where economic, social and cultural circumstances are significantly different. This results in in *"conceptualising and simplifying the African city. Yet, if there is something inherently true to 'the African city', it is that it resists characterisation and simplification in the manner demanded by Western-based rationalities. Climate change only exacerbates the mismatch between planners' sketches of the city and its actual dynamics."* (Broto 2014:260) so too may assessment metrics and methods developed by consultants and bodies extraneous to the local context fail to provide helpful guidance or frameworks (Broto 2014:259). Many of the green economic strategies touted by the first world are expensive, capital-intensive, highly mechanized and technologically advanced – making them a poor fit for countries where money may be scarce, there is a dire need for job creation, and a low skills base exists. These are countries where there is a great need to spin up economic activity, which usually means an increasing amount of negative environmental externalities, raising the possibility of conflict with green economy efforts. In a developing world context, where government's capacity to deliver basic services is usually already overwhelmed, and where societies often historically favour privileged minorities over impoverished majorities, climate change opportunities are only really accessible if they are able to 'capture' those who control access to support and funding. (Broto 2014:161).

Since we cannot see the future outcome of interventions, we should ensure that actual citizens' needs are acted upon, rather than simply applying 'best practice' from on high (Broto 2014:261).Broto suggests an approach of "multi-scalar collaboration", where local government acts in partnership with a range of other capable actors, both international, national and grass roots. This kind of cooperation enables flexible institutions, much better able to respond to an uncertain climate future in location-specific contexts (Broto 2014:259).

In Cape Town, at least in theory, there does appear to be a concern with the developmental context, and indeed the national priorities of reducing inequality and job and economic growth are incorporated into policy at every level. The South African green economy is appropriately designed for its context. However, the true test will be implementation, which should demonstrate whether in fact the local green economy is developmentally sound. It may be that the Cape's endowment with low-skilled green jobs (e.g. in agriculture and agri-processing) and green schemes like Working for Water enable the green economy to directly benefit the poorest.

5.4.2 Developing countries have significantly different problems to the West

UNEP, UNCTAD and UN-OHRLLS (2011a) note that there are significant institutional and financial hurdles for developing countries to transition to a green economy. They note that populations in developing countries generally have a higher immediate dependence on the environment compared to those in developed countries, making its protection a priority (UNEP et al 2011a:10). In particular, diversifying agricultural practice into organic forms promises to be a profitable activity (UNEP et al 2011a: 13). The role of good governance in facilitating the transition to the green economy is crucial – encouraging technological shifts, while providing clear policy and incentives can stimulate private sector transformation. Limited finances in developing countries make it critical that spending in sectors that are sustainable socially, ecologically and environmentally is prioritized. At the same time, the cooperation of the international community is very important. External financing is needed – in the wake of the financial crisis, many developing nations have been left with growing current account deficits, and home markets may lack the clout to catalyse enough financing for local green projects (UNEP et al 2011a :18-19). The form in which trade actions and policy is located need to be geared to drive the transition to a green economy – policy should recognise the importance of commodity trade to developing country economies, and should be formulated in a way that both sustain their resource bases and yield greater revenues without introducing undue market distortions and protectionism (UNEP et al 2011a:20-21). Reallocating investments towards the green economy may lead to slower economic growth in the short and medium term, but in the long run growth should speed up (Ocampo et al 2011:6). This of course, presents serious issues about whether such an approach is likely to be politically tenable for populations living on the breadline. This goes some way towards explaining why the green economy in Cape Town is presented as an addendum or reorientation of the local economy, rather than as a necessary replacement.

Kiunsi (2013) notes that attempts to adapt to an uncertain future may face additional problems in cities with very major public infrastructure deficits and high levels of informality, which characterize many cities in developing nations. In these cases, the lack of infrastructure such as roads, drainage, sewers and waste removal may have a significantly deleterious effects on the ability of the city to progress and adapt. These need to be addressed in tandem with adaption and mitigation measures. In Cape Town, as in other cities in developing nations, informality and infrastructure deficits have been a significant flashpoint for social unrest in recent years, and are associated with protest, crime

and violence. Apart from their negative effects on the social fabric of the city, these issues are also injurious to economic growth, and therefore economic plans need to retain a focus on addressing them.

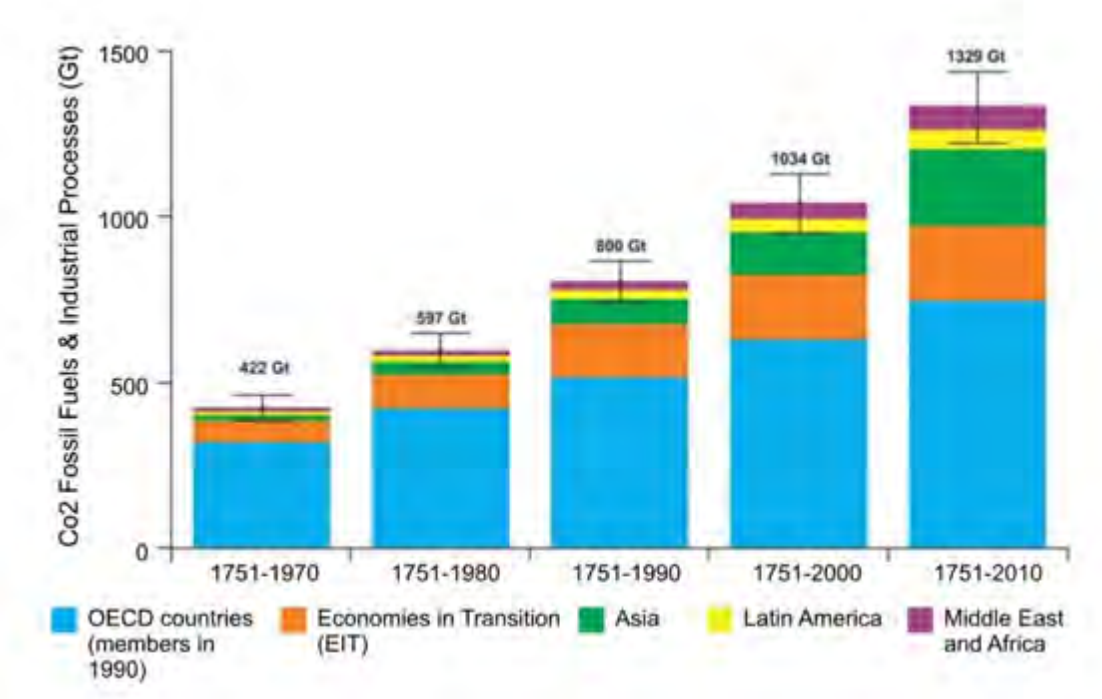
5.4.3 Irreconcilable development goals and political opposition

Resnick, Tarp and Thurlow (2012) note that the green economy is based on an implication that developmental objectives are compatible with environmental sustainability, resulting in wins in many areas: jobs, economic growth, poverty alleviation. However, the truth is that many green economy strategies are inconsistent with natural advantages and existing investments, and face significant resistance from citizen groups, particularly from poor communities. In the Mozambican biofuel industry for example, moving from a deforestation-heavy farming method to a more environmentally sustainable intensive land-use method resulted in job losses and political opposition. In Cape Town, introduction of the IRT system has led to opposition from the taxi industry. At the same time, a green economic approach may mean that developing countries have to move away from production strategies and resources that give them a natural competitive advantage (like South Africa has in coal mining and energy), and towards those that may be more expensive or technically challenging for them to implement – which may have the consequence of reinforcing inequalities.

5.4.4 Developing nations are not equally culpable for climate change

Climate change, to which the green economy is responding, has been largely caused by the cumulative emissions from developed countries since the advent of industrialisation. Although developing countries may have very high levels of emissions currently, they are still lower than the accumulated emissions of the developed world, particularly if emissions per capita are looked at (see figure 5 below).

Figure 5: Proportional contribution to emissions per capita (De Coninck et al 2014:21)



Furthermore, developed countries have mostly completed their processes of industrialisation, and generally are experiencing relatively high levels of social and economic development and stability. They are in a position where they seek to maintain quality of life and economic stability, rather than make progress towards achieving it – enabling a relatively simple focus on decreasing carbon footprints and ecological harm. For the developing world, this is far more complicated, as development is still the main priority – without attaining it, sustainability will have no basis. At the same time, following a traditional, western development path is not possible – a new way forward will have to be sought, and developing nations will need to forge a unique response to a sustainable future (De Coninck et al 2014:21-22).

Developing countries have raised concerns over the international regulatory aspect of the green economy – that it may result in: increased trade protectionism under the guise of environmental conservation, the imposition of green standards higher than what developing nations can meet, more conditions being placed on international financial aid, increased market access under the guise of green development by the West, and the subsidisation of production in the First World without remedial measures being taken for developing nations, leading to further concentrations of market power and increased global inequality. Other criticisms include the difficulties inherent in creating new green economic sectors in developing nations and the financialisation of nature. (UN-Habitat 2012:11-12; UNDESA 2012:61-62).

In a South African context, debates about culpability for emissions are somewhat absurd – as home to the largest point source CO^2 emitter in the southern hemisphere, possessing an electrical grid heavily dependent on coal, and having more gigantic coal power stations in the pipeline, the country is hardly in a position to argue that it is not contributing more than its fair share towards climate change. Arguments against the country's ability to switch to greener energy sources because of cost and technological inability are also suspect – South Africa is the most technologically advanced African country, with proven abilities in green tech, and currently is planning to spend a trillion rand in a controversial nuclear deal. It is clear that the strongest challenges against the green economy are arguments that claim it will negatively affect other developmental goals.

5.4.5 Economic issues tend to trump environmental ones

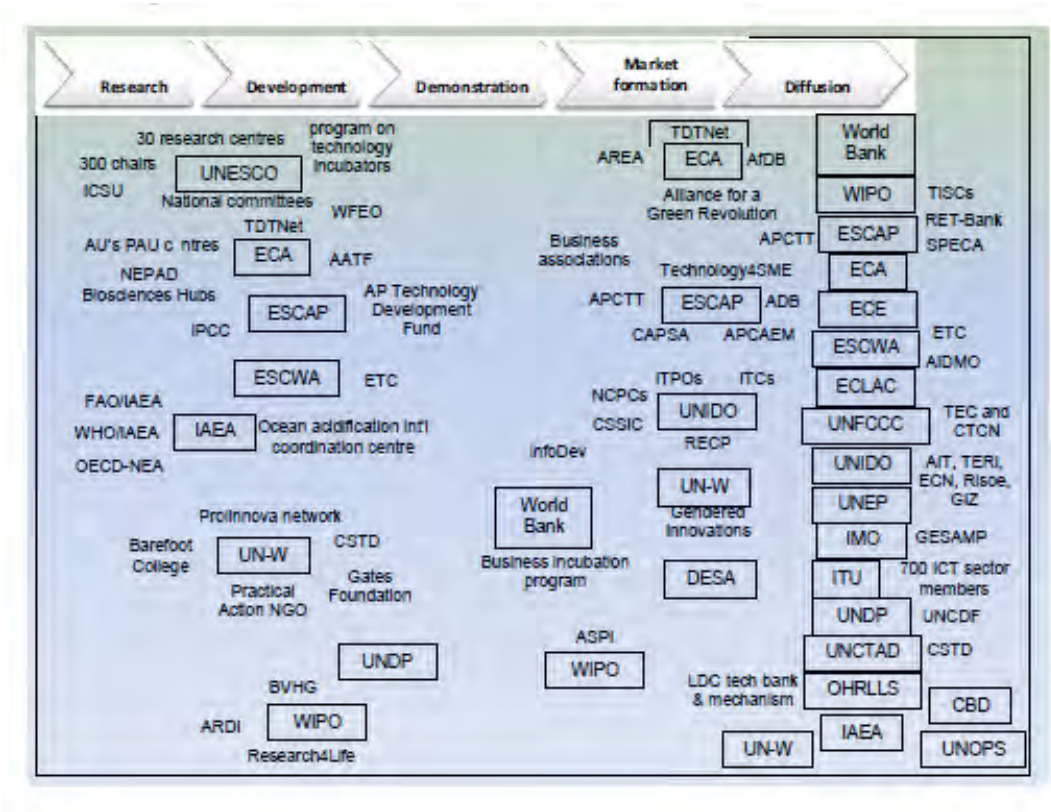
With the often dire circumstances facing developing countries and the possibility of concomitant social unrest, economic performance tends to trump environmental or social concerns. Parto et al (2007:286) describe a multi-country survey of the iron and steel industry that shows adoption of less polluting technologies is often due to economic efficiencies rather than regulatory pressure. The industry has also tended to reduce pollution with "end-of-pipe" solutions to reduce landfill costs, rather than attempting to clean up the entire production process. This raises the possibility that economic disincentives to pollute or regulations that place punitive costs on wasteful or pollutive processes may be more effective in directing the green behaviour of economic actors. It may, however, encourage polluting firms to export their pollution to countries that have less stringent policies in place (Parto et al 2007:286).

Improving the economy at the expense of the environment may have unexpected outcomes. Parto et al (2007) point out how in Mexico in the mid-1980s, the prioritisation of economic performance over environment actually led to an effective net loss of GDP. Trade liberalization resulted in average economic growth of 2.5% from 1988 to 1999, the damage to the environment during the same period is estimated to be worth around 10% of GDP. The lesson is that improving industrial output without a well-regulated and -enforced environmental framework already in place could lead to the erosion of economic growth. (Parto et al 2007: 14,142,290). South Africa fortunately does have a fairly well-developed environmental policy framework. However, producing the political consensus, will and alignment across in different ministries and spheres of government for effective implementation remains challenging. Putting economic incentives in place may therefore be a very valuable way of creating compliance.

5.4.6 Technological hurdles

Sagar and Majumdar (2014) advance the importance of technology in addressing sustainability challenges in developing countries. They note that an understanding of user needs is critical for a technology to be adopted successfully. An understanding of the intended market characteristics and conditions is also very important to address during the product development stage, as well as an understanding of dependencies and interrelations between policies, institutions and actors in the local economic context (ibid. 3). The authors note that in developing countries significant gaps exist in the funding of research, and that poorer countries spend significantly less on research on a GDP per capita basis by several order of magnitude, in comparison with wealthy countries (ibid. 8). It is therefore critical for poorer countries to be able to access technology through the assistance of international bodies. The authors note however, that where such schemes exist, the focus tends to be on the creation of markets and the selling of technologies rather than collaborative research and development (ibid. 9). They suggest that a means of addressing technological solutions to sustainability challenges be done via an organization that would nurture new technology developments, form product-development partnerships between tech and market actors to develop products and strategize on their dissemination, and offer incentive prizes for solutions that address particularly challenging sustainability issues (ibid. 18).

Figure 6: The relative few facilitation bodies that exist for R&D, compared to technology diffusion. UN contributions are shown in boxes (Sagar and Majumdar 2014:9).



It is worth noting however that in the Cape Town, there is a fairly strong support network for research, development and demonstration, as evidenced by the Design Indabas, Open Design, maker festivals, and specialised conventions that the city hosts. It does appear that products often struggle to find a market and be diffused into society at large.

5.5 Chapter Summary

This chapter presented a critique of the green economy covering: the general challenges involved in producing critical research, critiques of green economic theory and assumptions, and finally its applicability to the developing world. The following points were made:

- Producing critical research on the green economy is a challenging business: there is a dearth of quality research on it, and policy documentation can be bewildering to navigate.
- The transition to a green economy faces challenges in the form of competing against an already optimized system, high funding requirements, and radical changes to present systems of production and consumption in a very short time.
- It also requires extensive cooperation across borders, and the ability to balance present pressing concerns against the well-being of populations in distant places or as yet unborn. This makes it politically challenging for governments to implement policies that have long-term pay outs or that deal with issues spatially removed from voters.

- Green economics continues to pursue the goals of the very same economic system that produced the present crises, which may cause it to ignore more effective measures to combat climate change. It relies on applying averaged data to very different country conditions, and, despite setting ambitious targets, may in fact be under-estimating the level of change needed.

- Green economic theory uses models that use averaged data, rely on meeting very ambitious targets in order to succeed, and in reality, decoupling economic growth from emissions growth may not be possible.

- The logics underpinning conventional economics have also passed into green economics with little questioning – the neoliberal vision that created the green economy is creating the neoliberal structures to make it succeed.

- Attempts to direct the future are not neutral, but the result of the interaction of powerful regimes, and political and market actors who seek to shape cities and economies for their own purposes.

- The green economy is premised on continued fast growth, and resulting increased production and consumption. This is simply not compatible with environmental sustainability.

- The green economy, as much as it might create new jobs, has the potential to actually cause job losses, particularly in industries that are pollutive.

- In the developing world, applying the fixes designed by international planners and consultants may lead to unsuitable outcomes. Partnerships with communities should be emphasized for enabling appropriate outcomes.

- Developing countries face hurdles to adopting the green economy not faced by the West: high environmental dependencies, low finances, reliance on commodity trading, high levels of informality, and deficits in infrastructure. These must be addressed in tandem with green economic efforts.

- If other developmental issues and population needs are not addressed in developing countries, green economic activities may face opposition, or end up reinforcing inequality.

- Developing countries are not as culpable as developed nations in producing GHG emissions, making them face the same regulatory regimes as the West may disadvantage their developmental path.

- There is evidence to suggest that, in terms of urgency, economic issues tend to come before those affecting the environment. This suggests that policy-makers should consider imposing punitive costs on polluters to direct their behaviour.

CHAPTER 6: SUMMARY AND CONCLUSION

6.1 Introduction

This final chapter presents a summary of the findings of this minor dissertation, before making some concluding remarks.

6.2 Summary

1. The Industrial Revolution led to massive productivity gains, cheaper goods and improvements in livelihoods. It led to the creation of a middle class, with the wealth and leisure time to demand and enjoy an increasing number of products and services made available by the Revolution. Since then, further enormous technological change revolutions have been made in agricultural pesticides and fertilizers, plastics, computer chips, medical and material sciences, biotechnology, and more recently, nanotechnology. Unfortunately, there are costs involved in this equation. Mechanisation, automation and runaway consumption have led to a host of externalities: resource shortages, environmental damage, harmful pollution, and an economy based on fossil fuels have led to dramatic climate change, which threatens human livelihoods and environmental services critical to all life on Earth. The industrial economy has also disproportionately burdened the poor.

2. The green economy has been advanced as a way of addressing the environmental, social and economic polycrisis. Developed out of the discipline of sustainable development, the green economy has been given contemporary impetus by the burgeoning climate crisis as well as the global financial crash of 2007-08.

3. The green economy is given a wide variety of definitions in the literature, and there is no internationally agreed upon version. However, at a fundamental level, all definitions describe a reconfiguration of the conventional economy by government towards one that is able to mitigate (or even reverse) environmental damage and redress social inequalities. The green economy is very similar to the conventional growth economy in terms of its logics and operations, what has changed is its relationship to the wider environment, and its consideration of human beings. Government plays a particularly strong role in creating a transition to the new green economy. Death (2014) presents four typologies of the green economy, based on what different commentators tend to emphasize:
    - **Green revolution:** complete renovation of the economy to firmly resolve its externalities and contradictions;
    - **Green transformation:** the continuation of the present conventional economy, with the re-alignment of its overarching goals towards the principles of sustainable development;
    - **Green growth:** this views the green economy as the preeminent means to improve future economic growth through the creation of new market opportunities;
    - **Green resilience:** a sceptical attitude that emphasizes a mostly business-as-usual approach combined with some endeavours at improving resilience and adaptation.

4. Based on a review of the international literature, a Transition Framework was developed in this dissertation, describing the high-level conceptual foci underpinning descriptions of the transition from the present conventional economic system to the green economy. This was

developed as a tool to evaluate real-world green economies. The framework consists of the following elements:

i. **A government-led approach**, where government plays a top-down, proactive role in guiding the transition by use of policy, regulation, support, taxation, regulation and financing. Importantly, the government should ensure that long-term outcomes are incorporated into short-term policy. This is based on an understanding that within traditional markets there is little incentive to invest in untested new green strategies. Multi-Level Perspective theory was put forward as a means of creating transition and managing unpredictable change.

ii. **An urban focus**, which understands cities as crucial vectors for the development of the green economy. This understands cities as nexuses for consumption and emissions. It also sees them in terms of their geographical and spatial arrangement – properly leveraging this can result in significant gains.

iii. **Infrastructure-driven**, with the understanding that sees infrastructure as shaping the greenness of the future of a city, as well as providing opportunities for economic development.

iv. Predicated on **conventional economics**, in which cities need to adopt the characteristics that will make them successful in the conventional marketplace.

v. An understanding that sees the green economy as a deliverer of **employment** growth, supported by good **education** policies. That is, education should ensure workers are properly reskilled to transition into new green industries, guarantee that people entering the workforce have the requisite skills for a green economic future, as well as more generally ensuring that society at large understands global sustainability issues.

vi. **Innovation and technology** are seen as critical elements to using resources more efficiently and productively, and ultimately decoupling economic growth from resource use. The potential for developing countries to leapfrog over dirty technology in their development paths is also raised.

vii. **Managing natural capital** correctly is also emphasized. This means a holistic life-cycle understanding of products and services, correctly valuing natural resources and ecosystem services, and continuously monitoring and evaluating their functioning according to well-established indicators.

viii. Lastly, an approach is emphasized which sees some **sectors** as more important for the green economic transition due to their employment or sustainability potential: agriculture, forestry, fisheries, energy, recycling, the built environment, and public transport.

5. An overview of the Cape Town economy, society and environment was presented. This found that the city has a large population, high competition for available land, large scale poverty and inequality, an uncertain economic outlook, high rates of unemployment, low levels of entrepreneurship, large amounts of crime, and draws the majority of its energy requirements from unsustainable fuel sources. The city, taking its lead from national legislation, has adopted the *New Growth Path* economic strategy, which pre-eminences employment creation as the main goal of the country. The local rationale for adopting a green economy is predominantly premised on the need to address the carbon intensity of its economy and provide jobs.

6. Cape Town's definition of the green economy receives strong characterisation from provincial and national government descriptions. Nationally, a green economy is a *"system of economic activities related to the production, distribution and consumption of goods and services that result in improved human well-being over the long term, while not exposing future generations to significant environmental risks or ecological scarcities"* (SAGOV DEA 2015), whereas the Western Cape Province adopts UNEPs definition: *"[a green economy is] an economy that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities"* (WCG 2015:4, quoting UNEP 2010:5). The city itself privileges a green economic paradigm with a focus on improving economic growth and jobs.

7. The policy documents relating to the Cape Town green economy where then explored. Not all of them explicitly dealt with the green economy, however many of them mention elements relating to it, particularly sustainability and employment growth. National documents generally provide strategic direction, incentivisation, and funding. Provincial documents often relate to the metro city quite directly, and position it pre-eminently within the region. Key focuses are: attempts to reduce emissions, improve environmental sustainability and produce employment. On the metro level, addressing climate change is important, as well as envisioning the future of the city more widely. Protection of the environment is emphasized, as well as addressing poverty, creating jobs, and wider sustainability issues.

8. The Transition Framework from chapter 3 was then applied to the Cape Town situation, with the following results:
    - The green economy agenda is given leadership by national government, with provincial and local government taking large steps to fill in policy gaps, develop planning and produce successful implementation.

    - The green economy was found to be led by national government. However, provincial and local political manoeuvrings also play a role in the impetus towards the green economy – if the DA party ran a successful green economy in its Western Cape powerbase, it would serve to differentiate it from the ruling ANC, which has large interests in mining and coal power electricity generation.

    - The city's green economy is unashamedly urban, and has significant geo-spatial and sectoral focusses to its vision, and much of the policy, strategy and planning documentation being customised for local conditions.

    - Infrastructure is seen as a key driver of the transition, and particular focus has been paid to public transport – the rationale, however, has more to do with providing the poor with access to work opportunities than with emissions reductions.

    - The growth-focused economics of the green economy are seen as a welcome generator of jobs in the city. Facilitating the growth of small businesses and entrepreneurs is seen as critical to growing employment.

    - The city faces particular challenges in adopting green practices, particularly in energy generation, and maintaining the income streams it receives from selling electricity. Careful

planning must therefore be undertaken to ensure that the green economy adds to the city fiscus, rather than harming its tax income.

- Employment is a major focus of the green economy, particularly for its mitigatory effect on poverty, crime and social instability. Entrepreneurial activity is seen as a critical area to develop in order to produce more jobs. The provision of quality education is seen as a necessary component to ensure that workers are able to take part in the future economy. Employment and education are expressly linked to social stability and inclusion.

- The innovation and technological capacity of the city are privileged as means for the city to gain a competitive advantage: particularly in its linkages to knowledge generation and expertise in natural gas processing.

- Managing natural capital is an important aspect of the city's agricultural, fishery, tourism and water sectors.

- The City has taken a sectoral approach, identifying areas of consolidation and growth. It has also taken steps to begin putting in place institutions that will facilitate the continued success of these sectors.

9. A critical discussion of the validity of the green economy was then engaged in. Findings were:

    - There is a lack of research on the green economy. Locally, this is compounded by a bewildering policy environment.

    - Transition to a green economy is difficult, as it requires competing against and replacing existent, mature and optimised systems, over a very short timescale, and has high funding requirements.

    - The green economy is often predicated on the idea of mitigating present actions to diminish harmful effects on others who are distant, spatially or temporally – who therefore have a diminished voice in proceedings. This makes it politically challenging to institute: green economic processes require present populations to forgo some of their current activities in order to benefit the 'unborn' or the 'foreigner.'

    - The green economy may be based on a set of invalid assumptions: averaged data sets, inadequate emissions targets, funding availability, the speed of economic growth in various countries and the idea that climate and environmental issues can be resolved by the system that caused them in the first place.

    - Decoupling production from resource use in the short timescales required is not feasible.

    - The incorporation of neoliberal economic thought into green economics has gone largely unopposed. This may result in exploitation by particular regimes.

    - An economy based on the idea of continuous growth is not compatible with environmental health.

- Attempts to direct the future are not neutral, but the result of the interaction of powerful regimes, and political and market actors who seek to shape cities and economies for their own purposes.
- Applying the theories and plans of international experts to developing nations may result in a poor fit. Instead, effort should be made to understand local needs and cultures, and ensure widespread participatory planning.
- Green economies are likely to result in significant changes to employment as polluting industries are phased out. It will be important to ensure that these workers are reskilled. There is limited data available on this phenomenon in developing countries.
- A sustainable future should be based on an assessment of what an economy in a flourishing biosphere looks like, rather than simply trying to green the conventional economy. This would require significant changes to lifestyle patterns.
- Green economic theory suggests multiple win-win scenarios for groups across society. However, evidence suggests that strategies may in fact face serious resistance from different groups, and may lead to conflict with the poor, in particular.
- All countries are not equally culpable for climate change. Expecting countries which have not completed their process of industrialisation to implement green policies may unduly burden them.
- It is important for developing nations to put in place sound environmental policies during their industrialisation process, in order to avoid damage that may reverse GDP growth.
- Developing countries face challenges in adopting the technology needed for a green transition. Therefore, institutions should be created that incentivise problem-solving, facilitate product development, and aid market-dissemination.

6.3 Conclusion

This dissertation set out to investigate the Cape Town green economy policy (including strategies, plans and other documents) space, particularly its underpinning concepts and rationales. After providing an overview to the background and genesis of the green economy, a Transition Framework was developed from a reading of the international literature as a tool for analysing real-world policy discourse examples. The city of Cape Town was used as a case-study – its character and socio-economic data was discussed, as well as its policy environment. The Transition Framework was then applied to the city's green economy, in order to discern whether there were major deviations from the way the green economy is conceptualised internationally. It was discovered that the Cape Town green economy broadly conforms to the international conception, however, there are some reorientations of its priorities. Critical deviations were: the important role that political parties play in shaping the push to the local green economy; the fact that the city's spatial-geographic context is a special consideration for strategy and planning; the need to balance green interventions against local government tax income; and in particular, the predominant focus of the local green economy is the growth of the local economy and the creation of employment opportunities, to ensure social and

political stability. As per Death's (2014) taxonomy, the Cape Town green economy's dialogue emphasis is that of green growth.

Broadly, it is evident that green economic theory, as developed by the international literature, is contrived to be flexible enough to allow local governments significant freedom in shaping the green economy to local conditions. However, at the same time, this very flexibility presents concerns. Green economic theory, already showing large inadequacies with respect to addressing climate change and other environmental concerns, is in Cape Town being further moulded towards addressing social and employment issues, economic growth, the branding of the DA party, and political stability. There is also considerable 'flexibility' in terms of the extent to which governments are expected to observe the strictures of the green economy. In South Africa, this has meant that the green economy is treated as an addendum, rather than as a threat or challenge, to the conventional economy. While this non-threatening approach may result in easier adoption, it does raise the question of whether this will impede the ostensible goal of instituting a green economy in the first place – the mitigation of anthropogenic climate change and environmental damage. This undermines the urgency of the present ecological crisis and our future sustainability. The city, and the country at large, are part of a particularly marginal geographic region operating within particularly tight environmental boundaries. The polluting energy regime of South Africa, its aridity, and its water shortages make it both a crucial contributor to, and potential victim of, climate change. It is critical that the country keep the degradation of the environment a central focus of the green economy.

A focus on carbon is important, but solely concentrating on it allows equally harmful practices to persist, many of them with unquantified future effects. At the time of writing, a headline is *"Plastic to outweigh fish in oceans by 2050"* (Al Jazeera America 2016). While carbon emissions are an important consideration in the green economy, there are other environmental issues that are relatively simple to address, yet have not been enacted –prohibiting the use of plastic packaging, for example. Indeed, with respect to plastic, the emphasis has moved to job-creation through recycling, rather than restriction – monetizing an environmental crisis when the means to resolve it exists. This does give an indication of the priorities at play.

Cape Town's particular set of social, political and economic conditions have shaped green economic interventions towards a pro-poor, pro-growth, and pro-employment approach, that goes some way towards addressing climate change. This is necessary, both in addressing pressing social concerns and in gaining political traction, and the policies are generally well-designed. However, it is possible that such endeavours may be overtaken by the rapidly-evolving pace of change in the broader economic and natural environment. There are serious questions to be raised about the validity of green economic theory's assumptions, particularly regarding continuous economic growth, material consumption, and the reality of producing change at the speeds required. Unless these are actively addressed, the interventions of green economic theory are unlikely to effectively deal with runaway climate change, and may instead prolong the conventional economic system.

It is recommended that future work look at how green economy policies have fared in implementation (projects and businesses) in Cape Town. Have there been success stories, and importantly, are these building enough momentum towards shaping an economy that is sustainable? An investigation of the progress of green economy policy and outcomes in other South

African metros would also be of value, especially those under the leadership of other political parties, as this would go some way towards evidencing the role of party 'branding' in adoption of the green economy.

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APPENDICES

Appendix A: Interview: method and consent

Consent

The purpose of the research is explained as laid out on the Consent Form (see below). Where it is not possible for the physical consent form to be handed to the participant, the form will be read out and verbal consent will be gained.

Minors or those otherwise lacking sufficient capacity to consent were not consulted during the course of this research.

The participant was advised that he was voluntarily participating in research, and that he could withdraw at any point.

Confidentiality

As no data is being gathered about individuals or groups, the anonymity of sources is not relevant. Interviewee was treated in the same way literature resources are – correctly credited and cited. The results of the interview were submitted to the interviewee for approval, prior to publication.

Use of Deception

This Report does not employ the use of deception.

Institutional permissions

The interview was aimed at bringing to light an individual's insight into sustainability and economic issues within government and society, generally. The intention of the research was not to study particular institutions, but rather to gather facts about the theory, strategies, plans and projects that relate to sustainable and green economies in Cape Town.

Institutional permissions were not required. Interview subject spoke in his individual capacity.

Selection process

Participants were not recruited. Subject was approached telephonically. At the time of interview, the subject's consent to participate was obtained in writing (see Appendix A.2).

Inducements to participate

No inducements were offered to participate, other than the offer of the provision of a beverage.

Potential for harm

It is not envisaged that the interview will cause the interviewee harm as the purpose is the clarifying of facts, events, policies and projects that are already in the public domain. Personal opinions, and personal and social information were not solicited and are not relevant for this Report.

Interview process

The interview took the form of an open-ended discussions, and used the Interview Guide as a starting point for debate. The interview lasted roughly 1 hour, and was recorded with the permission of the interviewee, using a digital voice recorder. No filming took place.

Usage of data upon completion of research

Upon completion of the dissertation, the document remains publicly accessible via the author, his supervisor or department. The content of interviews and desktop research may be re-used in future as a reference for the purposes of research, public dissemination and other academic purposes.

Interview Guide

The purpose of the interview is to discuss the design and progress of the local green economy, as well as the economic/sustainability nexus more generally. The expert was approached for interview based on his knowledge regarding sustainability, economics, the government, urban planning, and related fields. His input is needed as a fact-gathering exercise, to reveal case studies, policy, theory and other literature, as well as to bring to light the various projects and planning relating to the topic. Although it was envisaged that the Interview would be informal, unscripted and open-ended, the following questions served as a basis to guide the discussion:

1. What is your understanding of the term "green economy?" How does it relate to sustainability?
2. What is happening in Cape Town with regard to the green economy, and sustainability and economics generally?
3. What is the City of Cape Town's green/sustainable economic vision?
4. How does the City of Cape Town intend to realise (transition to) this vision?
5. How does this green economic vision and transition compare to international best practice?

A.1. Consent form for Interviews

EXEMPLAR OF INFORMED CONSENT DOCUMENT
INFORMATION SHEET & CONSENT FORM
The Green Economy in Cape Town: A Sustainable Future?

Introduction

Hello, my name is Marko Petrik, and I am conducting research towards my Masters in Urban Infrastructure: Design & Management. I am researching Cape Town's efforts at establishing a green or sustainable economy and would like to invite you to participate in the project.

What the project is about

Human activity on planet Earth is contributing to a host of environmental ills: climate change, biodiversity loss, environmental damage. Many governments around the world are moving to address these issues. In South Africa, both the national, provincial and local governments are taking steps to adopt Green Economic models to mitigate the effect human economic activity has on the environment. I'm interested in examining these models, and questioning whether they are likely to produce the benefits that they are purported to. My concern is that they seem to do little to address some of the more serious practices and logics that are driving our current predicament: continuous market expansion and consumerism, for example. I would like to interview people who have a good understanding of these issues, and hear what they have to say about the success or failure of the green economy.

Participation

Please understand that you do not have to participate, i.e. your participation is voluntary. The choice to participate is yours alone. If you choose not to participate, there will be no negative consequence. If you choose to participate, but wish to withdraw at any time, you will be free to do so without negative consequence. However, I would be grateful if you would assist me by allowing me to interview you.
This interview should take between 20 minutes and an hour, depending on your availability. This is an unscripted interview, and its aim is for you to give me your understanding of the green economy and sustainability / economic nexus in general.

Benefit
No payment or reimbursement is available, although I will provide coffee or tea.

Risk of harm
No risk of harm is envisaged.

Recording
Would you be comfortable with me recording this conversation? YES / NO _____

Anonymity
This is not an anonymous interview. The intention of this interview to gather your thoughts, impressions, or knowledge of the topic. If I use this interview within my research, you will be properly credited and cited as a reference within my thesis.

Are you comfortable with being referenced in my thesis? YES / NO _____

If I reference you within a section of my thesis, would you like to approve the comment before I publish it?
YES / NO _____

Name:	
Signature:	
Date:	

A.2. Completed consent form – Interview subject: Anton Cartwright

INFORMATION SHEET & CONSENT FORM
The Green Economy in Cape Town: A Sustainable Future?

Introduction
Hello, my name is Marko Petrik, and I am conducting research towards my Masters in Urban Infrastructure: Design & Management. I am researching Cape Town's efforts at establishing a green or sustainable economy and would like to invite you to participate in the project.

What the project is about
Human activity on planet Earth is contributing to a host of environmental ills: climate change, biodiversity loss, environmental damage. Many governments around the world are moving to address these issues. In South Africa, both the national, provincial and local governments are taking steps to adopt Green Economic models to mitigate the effect human economic activity has on the environment. I'm interested in examining these models, and questioning whether they are likely to produce the benefits that they are purported to. My concern is that they seem to do little to address some of the more serious practices and logics that are driving our current predicament: continuous market expansion and consumerism, for example. I would like to interview people who have a good understanding of these issues, and hear what they have to say about the success or failure of the green economy.

Participation
Please understand that you do not have to participate, i.e. your participation is voluntary. The choice to participate is yours alone. If you choose not to participate, there will be no negative consequence. If you choose to participate, but wish to withdraw at any time, you will be free to do so without negative consequence. However, I would be grateful if you would assist me by allowing me to interview you.
This interview should take between 20 minutes and an hour, depending on your availability. This is an unscripted interview, and its aim is for you to give me a your understanding of the green economy and sustainability / economic nexus in general.

Benefit
No payment or reimbursement is available, although I will provide coffee or tea.

Risk of harm
No risk of harm is envisaged.

Recording
Would you be comfortable with me recording this conversation? (YES) / NO _____

Anonymity
This is not an anonymous interview. The intention of this interview to gather your thoughts, impressions, or knowledge of the topic. If I use this interview within my research, you will be properly credited and cited as a reference within my thesis.

Are you comfortable with being referenced in my thesis? (YES) / NO _____

If I reference you within a section of my thesis, would you like to approve the comment before I publish it?
(YES) / NO _____

Name:	Anton Cartwright
Signature:	
Date:	13-01-2015

Appendix B: Energy and Climate Change Action Plan (2011)

This Appendix is comprised of the City of Cape Town's Energy and Climate Action Plan 11 objectives, and the particular projects assigned to them. The status of the project as it stood in 2011 is provided.

Energy and Climate Change Action Plan (2011): Objectives, programmes and projects:

Key					
✓	Complete	→	ongoing	▲	planned

Objective 1 – citywide: 10% reduction in electricity consumption by 2012, off a business-as-usual baseline		
Programme area	***Project***	
Energy efficiency plan	*Detailed plan development based on Energy Scenarios for Cape Town study*	→
Electricity consumption reduction – residential and commercial	*Electricity Savings Campaign: Energy Efficiency Forum*	→
Solar water heating	*Mass roll-out of solar water heaters, mid- to high-income (low-income under Objective 7)*	▲
Metering as an energy efficiency measure	*Internet-based metering – large customers*	→
	Ripple control pilot	✓
	Smart metering for all consumers	▲
Energy efficiency in new/ renovated developments	*Preparation of Resource Efficient Development Policy*	▲
	Implementation of National Building Regulations Part XA – amendment which establishes energy efficiency requirements in all new build and renovations	▲
	Green Building Handbook	✓
Reduction in electricity theft	*Integration with electricity savings campaign*	→
Objective 2 – council operations: 10% reduction in energy consumption by 2012		
Programme area	***Project***	
Buildings retrofits	*Monitor six completed municipal buildings, continue behaviour-change work/best practice demonstration*	✓ →
	Ongoing retrofits of buildings until all are complete – use guaranteed savings method	▲
	Energy management system: Cape Town Stadium, ongoing monitoring/ best practice demo	✓
	Civic Centre retrofit – project implementation (audit complete)	▲
	City buildings – lighting retrofit and automatic meter reader installation	▲
	City clinics – solar water heaters retrofit – monitor/best practice demo	✓
	City fire stations – solar water heaters and energy efficient showerheads	▲
Upgrade existing City rental stock (CRU programme) Phase 1, 2 and 3	*Energy efficient lighting*	▲
	Solar water heaters where appropriate	▲
	Water-efficient devices	▲
	Thermal efficiency (ceilings)	▲
	Food security – food gardens	▲
Greening the City's procurement policy	*Development of the greening procedural document for the supply chain management policy*	→

Public lighting and traffic lighting retrofits	*Large-scale retrofits street and traffic lighting (Phase 1 and 2 complete)*	✓→
Energy efficient pumps	*Energy efficient water and sewerage pumps – assessment*	▲
Water efficiency	*Water efficiency integrated with electricity saving campaign – reduces need for pumping*	→
	Gravity-fed water supply – Green Point precinct	✓
Greening the City's fleet	*Green fleet programme development and implementation*	✓→
	Fuel-efficiency campaign	✓
	Eco-driver training pilot project	✓
Green IS&T	*Greening the City's information technology system*	▲
Objective 3 – 10% renewable and cleaner energy supply by 2020; meet the growth in electricity demand with cleaner/renewable supply, among other sources		
Programme area	***Project***	
Renewable energy and energy supply diversification plan	*Detailed plan development based on Energy Scenarios for Cape Town study*	▲
Renewable energy large-scale supply	*Darling wind power purchase agreement and sale of Green Electricity Certificates*	✓→
	Power purchase agreements with independent power producers	▲
	REBID for cities – assess potential	▲
	Combined cycle generation from natural gas sources (e.g. Kudu/Ibubhezi)	▲
Electricity generation from municipal operations	*Landfill gas project*	▲
	Micro-hydro on potable water flows: feasibility	✓
	Anaerobic digestion – wastewater and wet solid waste	▲
	Micro hydro pilot – Green Point Park	✓
Renewable energy small-scale supply	*Embedded generation/net-metering – development of technical specs for grid connection, meters, and tariffs*	→
	Small wind turbines – residential/commercial/industrial applications –development of technical specs for grid connection, and building permission guidelines/regulations	▲
Objective 4 – build a more compact, resource-efficient city		
Programme area	***Project***	
Spatial Development Framework	*Densification strategy and implementation mechanisms*	→
	Development Edges Policy – urban and coastal edges	→
	District spatial development plans and environmental management frameworks	▲
Planning for a low-carbon city	*Conference – partnership with Sustainable Energy Africa & InWent – 2009*	✓
Objective 5 – develop a more sustainable transport system		
Programme area	***Project***	
Integrated rapid transit system (IRT)	*Roll-out of IRT programme – Phase 1 complete*	✓→
	CDM application for IRT Phase 2	▲
Non-motorised transport (NMT)	*Citywide NMT: Klipfontein corridor, inner city and IRT Phase 1*	✓
Travel demand management	*Park-and-ride programme*	→
	Large employer programme	→
Objective 6 – adapt to and build resilience to climate change impacts		
Programme area	***Project***	
Climate Adaptation Plan of Action (CAPA)	*Detailed CAPA development*	→
	Coastal protection zone policy	→
	Food security and urban agriculture policy	→
	Water security	→

Objective 7 – improve the resilience of vulnerable communities		
Programme area	***Project***	
Low-income housing: energy efficiency	*Energy efficient housing – various projects*	✓→
	Kuyasa thermally-efficient housing implementation – project complete; CDM management ongoing	✓→
Low-income housing: greening	*Greening Tafelsig TA2 housing units, Kew Town, Wesbank, Witsands*	✓
Low-income housing: ceilings	*Retrofitting low-income houses with ceilings (Mamre pilot complete)*	✓→
Low-income housing: solar water heaters (SWHs)	*Retrofitting low-income houses with SWHs – partnership programme*	→
Objective 8 – enable local economic development in the energy sector		
Programme area	***Project***	
Renewable energy business	*SWH business in Cape Town: study complete*	✓
	Establishment of renewable energy SPV: Province/City – Green Cape	✓
	Establish green zone in Atlantis to attract energy manufacturing business	✓
	Support programmes which create local demand: e.g. SWH mass roll-out	→
Objective 9 – access climate finance		
Programme area	***Project***	
Carbon trading scoping and development	*Carbon projects scoping assessment*	✓
	Carbon Finance Capacity Building partnership	▲
	Kuyasa CDM project – carbon sales	→
Funding proposals to climate funds	*Funding applications as appropriate, as the City and in partnership with private sector and NGOs*	→
Objective 10 – raise awareness and promote behaviour change through communication and education programmes		
Programme area	***Project***	
Electricity saving campaign	*Electricity savings campaign roll-out – ongoing*	→
Energy Efficiency Forums	*Energy Efficiency Forum for commercial buildings and industrial sector*	→
Schools/Youth/Citizens	*Green schools' audit*	→
	Climate change adaptation and mitigation	→
	Energy efficiency and resource conservation	→
Smart Living campaign	*Smart Living corporate campaign – pilot*	✓
	Smart Living Handbook – revision and programmatic distribution	✓
City staff training	*Staff training programmes and material on Smart Living*	→
Enviroworks (biannual)	*Climate change edition, 2009; COP17 special edition, 2011*	✓
Green Building Handbook	*Green Building Handbook*	✓
Resource-efficiency campaign	*Green identifier for all resource management programmes*	→
	Climate Smart Cape Town campaign – stakeholder partnership campaign	→
Overall – research and development; data management; monitoring and evaluation		
Programme area	***Project***	

Energy and climate change: research and development	*Climate Change Think Tank – mitigation and adaptation research*	→
	Cape Town Energy Scenarios study, 2011	✓
	Sea-level rise and stormwater management study	✓
	Energy and climate change legislative and regulatory study	✓
	Low-carbon zone project WWF	✓
Energy data management, monitoring and evaluation	*Energy data management system pilot programme – partnership*	→
	Cape Town State of Energy Report, 2011	✓
	Urban atmospheric carbon measurement – CSIR project on Cape Town	→
Air Quality Management Plan	*Air quality management reporting*	→
	Vehicle emissions monitoring programme	→
Statutory/policy linkages and alignment	*IDP energy and climate change focus areas*	→
	Integrated Metropolitan Environmental Policy (IMEP) Agenda – development of business plans	✓

(CoCT 2011:45-49)

Appendix C: Assessment of Ethics in Research Projects Form

Please note that both the Head of Department and the Chair of the Faculty EIR committee signed copies of the Ethics form separately. Both forms are included in this Appendix. Below is the copy signed by the HOD, while the EIR Chair copy follows on page 117.

EBE Faculty: Assessment of Ethics in Research Projects (Rev2)

Any person planning to undertake research in the Faculty of Engineering and the Built Environment at the University of Cape Town is required to complete this form before collecting or analysing data. When completed it should be submitted to the supervisor (where applicable) and from there to the Head of Department. If any of the questions below have been answered YES, and the applicant is NOT a fourth year student, the Head should forward this form for approval by the Faculty EIR committee: submit to Ms Zulpha Geyer (Zulpha.Geyer@uct.ac.za: Chem Eng Building, Ph 021 650 4791). **NB: A copy of this signed form must be included with the thesis/dissertation/report when it is submitted for examination**

This form must only be completed once the most recent revision EBE EiR Handbook has been read.

Name of Principal Researcher/Student: Marko Petrik Department: Civil Engineering

Preferred email address of the applicant: red.swifts@gmail.com

If a Student: Degree: M.Phil. Urban Infrastructure Design & Management
Supervisor: A/Prof. Mark van Ryneveld

If a Research Contract indicate source of funding/sponsorship:

Research Project Title: The Green Economy in Cape Town: A Sustainable Future?

Overview of ethics issues in your research project:

Question 1: Is there a possibility that your research could cause harm to a third party (i.e. a person not involved in your project)?	~~YES~~	NO
Question 2: Is your research making use of human subjects as sources of data? If your answer is YES, please complete Addendum 2.	YES	~~NO~~
Question 3: Does your research involve the participation of or provision of services to communities? If your answer is YES, please complete Addendum 3.	~~YES~~	NO
Question 4: If your research is sponsored, is there any potential for conflicts of interest? If your answer is YES, please complete Addendum 4.	~~YES~~	NO

If you have answered YES to any of the above questions, please append a copy of your research proposal, as well as any interview schedules or questionnaires (Addendum 1) and please complete further addenda as appropriate. Ensure that you refer to the EiR Handbook to assist you in completing the documentation requirements for this form.

I hereby undertake to carry out my research in such a way that

- there is no apparent legal objection to the nature or the method of research; and
- the research will not compromise staff or students or the other responsibilities of the University;
- the stated objective will be achieved, and the findings will have a high degree of validity;
- limitations and alternative interpretations will be considered;
- the findings could be subject to peer review and publicly available; and
- I will comply with the conventions of copyright and avoid any practice that would constitute plagiarism.

Signed by:

	Full name and signature	Date
Principal Researcher/Student:	Marko Dragan Petrik	20 Feb 15
This application is approved by:		
Supervisor (if applicable):		20 Feb 15
HOD (or delegated nominee). *Final authority for all assessments with NO to all questions and for all undergraduate research.*		24 Feb 15
Chair : Faculty EIR Committee For applicants other than undergraduate students who have answered YES to any of the above questions.		

ADDENDUM 1:

Please append a copy of the research proposal here, as well as any interview schedules or questionnaires:

1 RESEARCH SUMMARY

1.1 Title

The Green Economy in Cape Town: A Sustainable Future?

1.2 Research Rationale and Motivation

Human activity on our planet is causing a host of externalities, such as emissions-driven climate change, biodiversity and ecosystem loss, pollution, and natural resource depletion. Cities play a critical role in the creation of these externalities, being both the places where pollutive activity is often located, as well as the source of demand for the products and services these activities provide.

There has been a slow but growing recognition by many governments for the need to begin addressing ecological destruction and climate change, and to steward their resources more responsibly. A key concept is the transition towards a new, less harmful and wasteful economic form, the so-called "Green Economy." This would be an economic system which is resource efficient, low carbon, sustainable, and eco-friendly (City of Cape Town 2012:10).

However, a transition from traditional business practices to a Green Economy is not simply a matter of replacing polluting activities with greener practices. In particular, it is the premise of this thesis that a truly sustainable green economy must re-evaluate the logics of the current neoliberal economic model that it is supposedly replacing – overconsumption, continuously growing market share, failure to take responsibility for externalities, value-free business decision-making, failure to account for ecosystem services, a reliance on technological solutions rather than true social change, etc. (Sukhdev 2012). Unless these logics are addressed, the new green economy may simply replicate the externalities of the old system. Thus, a move to a green economy is more than simply swapping dirty production for clean, it is a socio-technological transition – change must become embedded in society and the way it organizes itself (Mulder 2007:253). At the same time, unless economic opportunities in the green economy are suitably attractive, few businesses are likely to likely to make the transition to more sustainable practices.

To understand whether the green economic model that local government is proposing will truly be sustainable and eco-friendly, this thesis will look at the conceptual underpinnings of the various programmes and projects being run by the Cape Town Metro Municipality.

Although South Africa has the 27th biggest economy in the world, we are the 14th largest carbon emitter, with our carbon emissions per capita are 50% higher than those of China (International Energy Agency, 2010, quoted in Western Cape Government 2013: 6).

1.3 Short Reference List:

- Bishop, J; Bertrand, N; Gilbert, S; Grigg, A; Hwang, L; Kallesoe, M; Vakrou, A; van der Lugt, C; Vorhies, F. 2010. The Economics of Ecosystems and Biodiversity Report for Business – Executive Summary. United Nations Environment Programme. [Online]. Available: www.teebweb.org. [28 November 2014].
- City of Cape Town. 2012. City Development Strategy. City of Cape Town: CDS Team. [Online]. Available: www.capetown.gov.za . [28 November 2014].

- Geary, C. 2011. Sustainable Connections: Linking Sustainability and Economic Development Strategies. National League of Cities: Center for Research & Innovation. [Online]. Available: www.nlc.org . [11 February 2015].
- Moffatt, S; Suzuki, H; Iizuka, R. 2012. Eco2 Cities Guide: Ecological Cities as Economic Cities. The World Bank. [Online]. Available: http://siteresources.worldbank.org/ . [11 February 2015].
- Mulder, K. 2007. Innovation for Sustainable Development: from environmental design to transition management. Sustainable Science 2: 253-263
- Sukhdev, P. 2012. Can Today's Corporations Deliver Tomorrow's Economy? University of Cambridge: Programme for Sustainability Leadership. [Online]. Available: www.cisl.cam.ac.uk/ . [19 August 2014].
- Western Cape Government. 2013. Green is Smart: Western Cape Green Economy Strategy Framework. Western Cape Government, Cape Town. [Online]. Available: www.westerncape.gov.za/110green/documents/ . [8 August 2014].
- Western Cape Government. 2014. Western Cape Climate Change Response Strategy. Western Cape Government, Cape Town. [Online]. Available: http://eadp-westerncape.kznsshf.gov.za/sites/default/files/basic-page/uploads/Western%20Cape%20Climate%20Change%20Response%20Strategy%20%282014%29.pdf .[28 August 2014].
- Whitehead, M. 2013. Neoliberal Urban Environmentalism and the Adaptive City: Towards a Critical Urban Theory and Climate Change. Urban Studies 50(7):1348-1367

1.4 Aim of the Report

The aim of this Report is to investigate whether the City of Cape Town's Green Economy goals are in line with those needed for an effective transition to a sustainable economy, or whether this is likely to fail.

1.5 Objectives

i. Discover what the international thinking is on transitioning to sustainable economies
ii. Discover what the City of Cape Town Green Economic goals are
iii. Discover how the City of Cape Town intends to transition to a Green Economy
iv. To compare the City of Cape Town Green Economy goals and transition to international best practice

1.6 Research Questions

i. International Literature:
   a. Differentiate between a 'sustainable economy' and a 'green economy'?
   b. What does the international literature have to say about transitioning to sustainable economies?
ii. The City of Cape Town:
   a. What is happening in CT?
   b. What is the City of Cape Town's green/sustainable economic vision?
   c. How does the City of Cape Town intend to realize (transition to) this vision?
   d. How does this green economic vision and transition compare to international best practice?(this includes both what international bodies say, as well as what the critiques the literature brings to the table).

1.7 Problem Statement

There is a growing concern in the literature that, in the enthusiasm to make a swift transition to a green economics, the logics underlying the present, business-as-usual practices, that have caused our current

social, environmental and climate crises may end up being replicated – essentially dooming our attempts to create a sustainable economic future to failure.

1.8 Research Approach

This research report is a desktop-based review of academic literature, policy documents, journals, newspapers, websites and the like, as well as interviews with relevant parties. This is a qualitative study of the visions and goals of the City of Cape Town's green economy push – a series of activities of which many are still in their conceptual phase or infancy. Thus this report does not include quantitative data research. It will compare qualitative concepts, and project their expected fruit (or lack thereof) into the future.

1.9 Scope and delimitations

As noted above, this report's scope encompasses a qualitative study of the green and sustainable economic concepts mooted by various bodies. Thus it will be limited to a qualitative review, and does not look at quantitative data.

2 Research Methodology

2.1 Introduction

This research paper will primarily be a qualitative desktop study using published information available in journals, libraries and the internet. Experts in the filed may also be approached for commentary, although it is not envisaged that more than 2 to 6 will be interviewed.

2.2 Prior Experience

The author has prior experience in desktop research using a variety of literature resources: academic journals and papers, policy, book, web and other publications, and has also conducted both telephonic and face-to-face interviews in the past.

2.3 Assistants

No assistants will be used.

2.4 Limitations

No population data or statistics will be collected. No volunteers will be recruited.

2.5 Types of information to be collected

2.5.1 Literature

The following resources will be used: policy documents, academic papers and journals, websites, books, government communications, national provincial and municipal strategy documents, and other publicly available documents and recordings.

These documents and resources will be consulted to compile the information needed to answer the research questions.

2.5.2 Interviews

A minor part of the research conducted in this Report will be a set of informal interviews with various experts in the field.

The nature of these interviews is to be preliminary to the main purpose of the research, which is documentary analysis.

Experts will be approached for interviews based on their experience or knowledge regarding sustainability, economics, the government, urban planning, and related fields. Their input is needed as a fact-gathering exercise, to reveal case studies, policy, theory and other literature, as well as to bring to light the various projects and planning relating to the topic.

Experts may be drawn from various places in society including government, NGOs, academia, business, and so on. It is envisaged that between 2 to 6 experts will be approached.

Interviews will take the form of face-to-face discussions. Interviews will be informal, unscripted and open-ended. The Interview Guide (attached below) will serve as a guide for discussion, but the open-ended nature of the interviews means that the discussion may not be limited to these topics.

Sound recordings may be taken, with the permission of the interviewee. The primary form of recording will be notes taken during the interview.

All expert views will be correctly cited.

Personal or social information will not be solicited, merely information that subjects in their positions are entitled to reveal.

2.5.3 Interview Subjects

2.5.3.1 Consent

The purpose of the research will be explained as is laid out on the Consent Form below. Where it is not possible for the physical consent form to be handed to the participant, the form will be read out and verba consent will be gained.

It is not envisaged that minors or those otherwise lacking sufficient capacity to consent will be consulted during the course of this research.

Participants will be advised that they are voluntarily participating in research, and that they may withdraw at any point.

2.5.3.2 Confidentiality

As no data is being gathered about individuals or groups, the anonymity of sources is not relevant. Interviewees will be treated in the same way literature resources will be – correctly credited and cited. Th results of interviews will be submitted to the interviewees for approval, prior to publication.

2.5.3.3 Use of Deception

This Report does not employ the use of deception.

2.5.3.4 Institutional permissions

The interviews are aimed at individuals, for their knowledge and commentary on sustainability and economic issues within government and society generally. The intention of the research is not to study particular institutions or individuals as they relate to them, rather, the aim is to gather facts about the theory, strategies, plans and projects that relate to sustainable and green economies in Cape Town.

It is not envisaged that institutional permissions will be required. If needed, the report supervisor will obtain the necessary permissions.

2.5.3.5 Selection process

Participants will not be recruited. Selected experts will be approached telephonically or by email to arrange an interview. If the subject agrees to be interviewed, a date will be set. At the time of interview, the subject's consent to participate will be obtained either verbally (if interview is telephonic) or in writing (if in person, see Consent Form).

They will be advised that participation in the research is voluntary.

2.5.3.6 Inducements to participate

No inducements are offered to participate; however, the interviewer may buy the interviewee a cup of coffee or suchlike depending where the interview takes place.

2.5.3.7 Characteristics of Interviewees

Interviewees will be selected on the basis of their institutional affiliation, expertise, work experience or knowledge in the fields the research may cover: green economies, sustainability, urban planning, government and so on.

2.5.3.8 Potential for harm

It is not envisaged that the interviews will cause the interviewees harm as the purpose of them is the clarifying of facts, events, policies and projects that are already in the public domain. Personal opinions, and personal and social information will not be solicited and are not relevant for this Report.

2.5.4 Interview process

Interviews will take the form of open-ended discussions, and will use the Interview Guide as a starting point for debate. Interviews will last between 20 min and 1 hour depending on the interviewee's availability, and may be followed up for clarification, if necessary.

Interviews may be recorded with the permission of the interviewees, using a tape recorder. No filming will take place.

2.6 Usage of data upon completion of research

Upon completion of the research report, the document will remain publicly accessible via the author, his supervisor or department. The content of interviews and desktop research may be re-used in future as a reference for the purposes of research, public dissemination and other academic purposes.

3 INTERVIEW GUIDE

The purpose of the interviews is to discuss the design and progress of the local green economy, as well as the economic / sustainability nexus more generally. Experts are approached for interviews based on their experience or knowledge regarding sustainability, economics, the government, urban planning, and related fields. They may be drawn from various places in society including government, NGOs, academia, business, and so on.

The nature of these interviews is to be preliminary to the main purpose of the research, which is documentary analysis.

Their input is needed as a fact-gathering exercise, to reveal case studies, policy, theory and other literature, as well as to bring to light the various projects and planning relating to the topic. Although it is envisaged that Interviews will be informal, unscripted and open-ended, the following questions will serve as a basis to guide the discussion:

1. What is your understanding of the term "green economy?" How does it relate to sustainability?
2. What is happening in Cape Town with regard to the green economy, and sustainability and economics generally?
3. What is the City of Cape Town's green/sustainable economic vision?
4. How does the City of Cape Town intend to realize (transition to) this vision?
5. How does this green economic vision and transition compare to international best practice?

4 CONSENT FORM

EXEMPLAR OF INFORMED CONSENT DOCUMENT
INFORMATION SHEET & CONSENT FORM
The Green Economy in Cape Town: A Sustainable Future?

Introduction
My name is Marko Petrik, and I am conducting research towards my Masters in Urban Infrastructure: Design & Management. I am researching Cape Town's efforts at establishing a green or sustainable economy and would like to invite you to participate in the project.

What the project is about
Human activity on planet Earth is contributing to a host of environmental ills: climate change, biodiversity loss, environmental damage. Many governments around the world are moving to address these issues. In South Africa, both the national, provincial and local governments are taking steps to adopt Green Economic models to mitigate the effect human economic activity has on the environment. I'm interested in examining these models, and questioning whether they are likely to produce the benefits that they are purported to. My concern is that they seem to do little to address some of the more serious practices and logics that are driving our current predicament: continuous market expansion and consumerism, for example. I would like to interview people who have a good understanding of these issues, and hear what they have to say about the success or failure of the green economy.

Participation
Please understand that you do not have to participate, i.e. your participation is voluntary. The choice to participate is yours alone. If you choose not to participate, there will be no negative consequence. If you choose to participate, but wish to withdraw at any time, you will be free to do so without negative consequence. However, I would be grateful if you would assist me by allowing me to interview you. This interview should take between 20 minutes and an hour, depending on your availability. This is an unscripted interview, and its aim is for you to give me a your understanding of the green economy and sustainability / economic nexus in general.

Purpose
The purpose of this interview is to bring to light activities, plans and projects relating to the green economy in Cape Town.

Benefit
No payment or reimbursement is available, although I will provide coffee or tea.

Risk of harm
No risk of harm is envisaged.

Recording
Would you be comfortable with me recording this conversation? YES / NO _____

Anonymity
This is not an anonymous interview. The intention of this interview to gather your thoughts, impressions, or knowledge of the topic. If I use this interview within my research, you will be properly credited and cited as a reference within my thesis.

Are you comfortable with being referenced in my thesis? YES / NO _____

If I reference you within a section of my thesis, would you like to approve the comment before I publish it?
YES / NO _____

Name:	
Signature:	
Date:	

ADDENDUM 2:

To be completed if you answered YES to Question 2:

It is assumed that you have read the UCT Code for Research involving Human Subjects (available at http://web.uct.ac.za/depts/educate/download/uctcodeforresearchinvolvinghumansubjects.pdf) in order to be able to answer the questions in this addendum.

2.1 Does the research discriminate against participation by individuals, or differentiate between participants, on the grounds of gender, race or ethnic group, age range, religion, income, handicap, illness or any similar classification?	YES	**NO**
2.2 Does the research require the participation of socially or physically vulnerable people (children, aged, disabled, etc) or legally restricted groups?	YES	**NO**
2.3 Will you not be able to secure the informed consent of all participants in the research? (In the case of children, will you not be able to obtain the consent of their guardians or parents?)	YES	**NO**
2.4 Will any confidential data be collected or will identifiable records of individuals be kept?	**YES**	NO
2.5 In reporting on this research is there any possibility that you will not be able to keep the identities of the individuals involved anonymous?	**YES**	NO
2.6 Are there any foreseeable risks of physical, psychological or social harm to participants that might occur in the course of the research?	YES	**NO**
2.7 Does the research include making payments or giving gifts to any participants?	YES	**NO**

If you have answered YES to any of these questions, please describe below how you plan to address these issues:

As a preliminary investigation, I will be interviewing between 2 and 6 experts in the field to gain focus and direction for my research.

They will participate in the research voluntarily, with full knowledge of what this entails, as detailed in the Consent Form (attached).

They will be identified as a source within my paper and its reference list in the same way that I would identify a particular book, academic paper or journal that I referenced during the course of my research.

The nature of these interviews will be very preliminary to the main, document-based, investigation. In the event that the interviewee does appear as a source for an in-text quote or comment, the section will be sent to them for approval.

ADDENDUM 3:

To be completed if you answered YES to Question 3: NOT RELEVANT. DID NOT ANSWER YES.

3.1 Is the community expected to make decisions for, during or based on the research?	YES	NO
3.2 At the end of the research will any economic or social process be terminated or left unsupported, or equipment or facilities used in the research be recovered from the participants or community?	YES	NO
3.3 Will any service be provided at a level below the generally accepted standards?	YES	NO

If you have answered YES to any of these questions, please describe below how you plan to address these issues:

ADDENDUM 4:

To be completed if you answered YES to Question 4

4.1 Is there any existing or potential conflict of interest between a research sponsor, academic supervisor, other researchers or participants?	YES	NO
4.2 Will information that reveals the identity of participants be supplied to a research sponsor, other than with the permission of the individuals?	YES	NO
4.3 Does the proposed research potentially conflict with the research of any other individual or group within the University?	YES	NO

If you have answered YES to any of these questions, please describe below how you plan to address these issues:

EBE Faculty: Assessment of Ethics in Research Projects (Rev2)

Any person planning to undertake research in the Faculty of Engineering and the Built Environment at the University of Cape Town is required to complete this form before collecting or analysing data. When completed it should be submitted to the supervisor (where applicable) and from there to the Head of Department. If any of the questions below have been answered YES, and the applicant is NOT a fourth year student, the Head should forward this form for approval by the Faculty EIR committee: submit to Ms Zulpha Geyer (Zulpha.Geyer@uct.ac.za; Chem Eng Building, Ph 021 650 4791).
NB: A copy of this signed form must be included with the thesis/dissertation/report when it is submitted for examination

This form must only be completed once the most recent revision EBE EIR Handbook has been read.

Name of Principal Researcher/Student: Marko Petrik Department: Civil Engineering

Preferred email address of the applicant: red.swifts@gmail.com

If a Student: Degree: M.Phil. Urban Infrastructure Design & Management
Supervisor: Prof. Mark van Ryneveld

If a Research Contract indicate source of funding/sponsorship:

Research Project Title: The Green Economy in Cape Town: A Sustainable Future?

Overview of ethics issues in your research project:

Question 1: Is there a possibility that your research could cause harm to a third party (i.e. a person not involved in your project)?	YES	NO
Question 2: Is your research making use of human subjects as sources of data? If your answer is YES, please complete Addendum 2.	YES	NO
Question 3: Does your research involve the participation of or provision of services to communities? If your answer is YES, please complete Addendum 3.	YES	NO
Question 4: If your research is sponsored, is there any potential for conflicts of interest? If your answer is YES, please complete Addendum 4.	YES	NO

If you have answered YES to any of the above questions, please append a copy of your research proposal, as well as any interview schedules or questionnaires (Addendum 1) and please complete further addenda as appropriate. Ensure that you refer to the EIR Handbook to assist you in completing the documentation requirements for this form.

I hereby undertake to carry out my research in such a way that

- there is no apparent legal objection to the nature or the method of research; and
- the research will not compromise staff or students or the other responsibilities of the University;
- the stated objective will be achieved, and the findings will have a high degree of validity;
- limitations and alternative interpretations will be considered;
- the findings could be subject to peer review and publicly available; and
- I will comply with the conventions of copyright and avoid any practice that would constitute plagiarism

Signed by:

	Full name and signature	Date
Principal Researcher/Student:	Marko Dragan Petrik	20 Feb 15

This application is approved by:

Supervisor (if applicable):		20 Feb 15
HOD (or delegated nominee): *Final authority for all assessments with NO to all questions and for all undergraduate research.*		
Chair : Faculty EIR Committee For applicants other than undergraduate students who have answered YES to any of the above questions.		13/03/2015

ADDENDUM 1:

Please append a copy of the research proposal here, as well as any interview schedules or questionnaires:

1 RESEARCH SUMMARY

1.1 Title

The Green Economy in Cape Town: A Sustainable Future?

1.2 Research Rationale and Motivation

Human activity on our planet is causing a host of externalities, such as emissions-driven climate change, biodiversity and ecosystem loss, pollution, and natural resource depletion. Cities play a critical role in the creation of these externalities, being both the places where pollutive activity is often located, as well as the source of demand for the products and services these activities provide.

There has been a slow but growing recognition by many governments for the need to begin addressing ecological destruction and climate change, and to steward their resources more responsibly. A key concept is the transition towards a new, less harmful and wasteful economic form, the so-called "Green Economy." This would be an economic system which is resource efficient, low carbon, sustainable, and eco-friendly (City of Cape Town 2012:10).

However, a transition from traditional business practices to a Green Economy is not simply a matter of replacing polluting activities with greener practices. In particular, it is the premise of this thesis that a truly sustainable green economy must re-evaluate the logics of the current neoliberal economic model that it is supposedly replacing – overconsumption, continuously growing market share, failure to take responsibility for externalities, value-free business decision-making, failure to account for ecosystem services, a reliance on technological solutions rather than true social change, etc. (Sukhdev 2012). Unless these logics are addressed, the new green economy may simply replicate the externalities of the old system. Thus, a move to a green economy is more than simply swapping dirty production for clean, it is a socio-technological transition – change must become embedded in society and the way it organizes itself (Mulder 2007:253). At the same time, unless economic opportunities in the green economy are suitably attractive, few businesses are likely to likely to make the transition to more sustainable practices.

To understand whether the green economic model that local government is proposing will truly be sustainable and eco-friendly, this thesis will look at the conceptual underpinnings of the various programmes and projects being run by the Cape Town Metro Municipality.

Although South Africa has the 27th biggest economy in the world, we are the 14th largest carbon emitter, with our carbon emissions per capita are 50% higher than those of China (International Energy Agency, 2010, quoted in Western Cape Government 2013: 6).

1.3 Short Reference List:

- Bishop, J; Bertrand, N; Gilbert, S; Grigg, A; Hwang, L; Kallesoe, M; Vakrou, A; van der Lugt, C; Vorhies, F. 2010. The Economics of Ecosystems and Biodiversity Report for Business – Executive Summary. United Nations Environment Programme. [Online]. Available: www.teebweb.org. [28 November 2014].
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- Moffatt, S; Suzuki, H; Iizuka, R. 2012. Eco2 Cities Guide: Ecological Cities as Economic Cities. The World Bank. [Online]. Available: http://siteresources.worldbank.org/ . [11 February 2015].
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- Sukhdev, P. 2012. Can Today's Corporations Deliver Tomorrow's Economy? University of Cambridge: Programme for Sustainability Leadership. [Online]. Available: www.cisl.cam.ac.uk/ . [19 August 2014].
- Western Cape Government. 2013. Green is Smart: Western Cape Green Economy Strategy Framework. Western Cape Government, Cape Town. [Online]. Available: www.westerncape.gov.za/110green/documents/ . [8 August 2014].
- Western Cape Government. 2014. Western Cape Climate Change Response Strategy. Western Cape Government, Cape Town. [Online]. Available: http://eadp-westerncape.kznsshf.gov.za/sites/default/files/basic-page/uploads/Western%20Cape%20Climate%20Change%20Response%20Strategy%20%282014%29.pdf .[28 August 2014].
- Whitehead, M. 2013. Neoliberal Urban Environmentalism and the Adaptive City: Towards a Critical Urban Theory and Climate Change. Urban Studies 50(7):1348-1367

1.4 Aim of the Report

The aim of this Report is to investigate whether the City of Cape Town's Green Economy goals are in line with those needed for an effective transition to a sustainable economy, or whether this is likely to fail.

1.5 Objectives

i. Discover what the international thinking is on transitioning to sustainable economies
ii. Discover what the City of Cape Town Green Economic goals are
iii. Discover how the City of Cape Town intends to transition to a Green Economy
iv. To compare the City of Cape Town Green Economy goals and transition to international best practice

1.6 Research Questions

i. International Literature:
   a. Differentiate between a 'sustainable economy' and a 'green economy'?
   b. What does the international literature have to say about transitioning to sustainable economies?
ii. The City of Cape Town:
   a. What is happening in CT?
   b. What is the City of Cape Town's green/sustainable economic vision?
   c. How does the City of Cape Town intend to realize (transition to) this vision?
   d. How does this green economic vision and transition compare to international best practice?(this includes both what international bodies say, as well as what the critiques the literature brings to the table).

1.7 Problem Statement

There is a growing concern in the literature that, in the enthusiasm to make a swift transition to a green economics, the logics underlying the present, business-as-usual practices, that have caused our current

social, environmental and climate crises may end up being replicated – essentially dooming our attempts to create a sustainable economic future to failure.

1.8 Research Approach

This research report is a desktop-based review of academic literature, policy documents, journals, newspapers, websites and the like, as well as interviews with relevant parties. This is a qualitative study of the visions and goals of the City of Cape Town's green economy push – a series of activities of which many are still in their conceptual phase or infancy. Thus this report does not include quantitative data research. It will compare qualitative concepts, and project their expected fruit (or lack thereof) into the future.

1.9 Scope and delimitations

As noted above, this report's scope encompasses a qualitative study of the green and sustainable economic concepts mooted by various bodies. Thus it will be limited to a qualitative review, and does not look at quantitative data.

2 Research Methodology

2.1 Introduction

This research paper will primarily be a qualitative desktop study using published information available in journals, libraries and the internet. Experts in the filed may also be approached for commentary, although it is not envisaged that more than 2 to 6 will be interviewed.

2.2 Prior Experience

The author has prior experience in desktop research using a variety of literature resources: academic journals and papers, policy, book, web and other publications, and has also conducted both telephonic and face-to-face interviews in the past.

2.3 Assistants

No assistants will be used.

2.4 Limitations

No population data or statistics will be collected. No volunteers will be recruited.

2.5 Types of information to be collected

2.5.1 Literature

The following resources will be used: policy documents, academic papers and journals, websites, books, government communications, national provincial and municipal strategy documents, and other publicly available documents and recordings.

These documents and resources will be consulted to compile the information needed to answer the research questions.

2.5.2 Interviews

A minor part of the research conducted in this Report will be a set of informal interviews with various experts in the field.

The nature of these interviews is to be preliminary to the main purpose of the research, which is documentary analysis.

Experts will be approached for interviews based on their experience or knowledge regarding sustainability, economics, the government, urban planning, and related fields. Their input is needed as a fact-gathering exercise, to reveal case studies, policy, theory and other literature, as well as to bring to light the various projects and planning relating to the topic.

Experts may be drawn from various places in society including government, NGOs, academia, business, and so on. It is envisaged that between 2 to 6 experts will be approached.

Interviews will take the form of face-to-face discussions. Interviews will be informal, unscripted and open-ended. The Interview Guide (attached below) will serve as a guide for discussion, but the open-ended nature of the interviews means that the discussion may not be limited to these topics.

Sound recordings may be taken, with the permission of the interviewee. The primary form of recording will be notes taken during the interview.

All expert views will be correctly cited.

Personal or social information will not be solicited, merely information that subjects in their positions are entitled to reveal.

2.5.3 Interview Subjects

2.5.3.1 Consent

The purpose of the research will be explained as is laid out on the Consent Form below. Where it is not possible for the physical consent form to be handed to the participant, the form will be read out and verbal consent will be gained.

It is not envisaged that minors or those otherwise lacking sufficient capacity to consent will be consulted during the course of this research.

Participants will be advised that they are voluntarily participating in research, and that they may withdraw at any point.

2.5.3.2 Confidentiality

As no data is being gathered about individuals or groups, the anonymity of sources is not relevant. Interviewees will be treated in the same way literature resources will be – correctly credited and cited. The results of interviews will be submitted to the interviewees for approval, prior to publication.

2.5.3.3 Use of Deception

This Report does not employ the use of deception.

2.5.3.4 Institutional permissions

The interviews are aimed at individuals, for their knowledge and commentary on sustainability and economic issues within government and society generally. The intention of the research is not to study particular institutions or individuals as they relate to them, rather, the aim is to gather facts about the theory, strategies, plans and projects that relate to sustainable and green economies in Cape Town.

It is not envisaged that institutional permissions will be required. If needed, the report supervisor will obtain the necessary permissions.

2.5.3.5 Selection process

Participants will not be recruited. Selected experts will be approached telephonically or by email to arrange an interview. If the subject agrees to be interviewed, a date will be set. At the time of interview, the subject's consent to participate will be obtained either verbally (if interview is telephonic) or in writing (if in person, see Consent Form).

They will be advised that participation in the research is voluntary.

2.5.3.6 Inducements to participate

No inducements are offered to participate; however, the interviewer may buy the interviewee a cup of coffee or suchlike depending where the interview takes place.

2.5.3.7 Characteristics of Interviewees

Interviewees will be selected on the basis of their institutional affiliation, expertise, work experience or knowledge in the fields the research may cover: green economies, sustainability, urban planning, government and so on.

2.5.3.8 Potential for harm

It is not envisaged that the interviews will cause the interviewees harm as the purpose of them is the clarifying of facts, events, policies and projects that are already in the public domain. Personal opinions, and personal and social information will not be solicited and are not relevant for this Report.

2.5.4 Interview process

Interviews will take the form of open-ended discussions, and will use the Interview Guide as a starting point for debate. Interviews will last between 20 min and 1 hour depending on the interviewee's availability, and may be followed up for clarification, if necessary.

Interviews may be recorded with the permission of the interviewees, using a tape recorder. No filming will take place.

2.6 Usage of data upon completion of research

Upon completion of the research report, the document will remain publicly accessible via the author, his supervisor or department. The content of interviews and desktop research may be re-used in future as a reference for the purposes of research, public dissemination and other academic purposes.

3 INTERVIEW GUIDE

The purpose of the interviews is to discuss the design and progress of the local green economy, as well as the economic / sustainability nexus more generally. Experts are approached for interviews based on their experience or knowledge regarding sustainability, economics, the government, urban planning, and related fields. They may be drawn from various places in society including government, NGOs, academia, business, and so on.

The nature of these interviews is to be preliminary to the main purpose of the research, which is documentary analysis.

Their input is needed as a fact-gathering exercise, to reveal case studies, policy, theory and other literature, as well as to bring to light the various projects and planning relating to the topic. Although it is envisaged that interviews will be informal, unscripted and open-ended, the following questions will serve as a basis to guide the discussion:

1. What is your understanding of the term "green economy?" How does it relate to sustainability?
2. What is happening in Cape Town with regard to the green economy, and sustainability and economics generally?
3. What is the City of Cape Town's green/sustainable economic vision?
4. How does the City of Cape Town intend to realize (transition to) this vision?
5. How does this green economic vision and transition compare to international best practice?

4 CONSENT FORM

EXEMPLAR OF INFORMED CONSENT DOCUMENT
INFORMATION SHEET & CONSENT FORM
The Green Economy in Cape Town: A Sustainable Future?

Introduction
My name is Marko Petrik, and I am conducting research towards my Masters in Urban Infrastructure: Design & Management. I am researching Cape Town's efforts at establishing a green or sustainable economy and would like to invite you to participate in the project.

What the project is about
Human activity on planet Earth is contributing to a host of environmental ills: climate change, biodiversity loss, environmental damage. Many governments around the world are moving to address these issues. In South Africa, both the national, provincial and local governments are taking steps to adopt Green Economic models to mitigate the effect human economic activity has on the environment. I'm interested in examining these models, and questioning whether they are likely to produce the benefits that they are purported to. My concern is that they seem to do little to address some of the more serious practices and logics that are driving our current predicament: continuous market expansion and consumerism, for example. I would like to interview people who have a good understanding of these issues, and hear what they have to say about the success or failure of the green economy.

Participation
Please understand that you do not have to participate, i.e. your participation is voluntary. The choice to participate is yours alone. If you choose not to participate, there will be no negative consequence. If you choose to participate, but wish to withdraw at any time, you will be free to do so without negative consequence. However, I would be grateful if you would assist me by allowing me to interview you.
This interview should take between 20 minutes and an hour, depending on your availability. This is an unscripted interview, and its aim is for you to give me a your understanding of the green economy and sustainability / economic nexus in general.

Purpose
The purpose of this interview is to bring to light activities, plans and projects relating to the green economy in Cape Town.

Benefit
No payment or reimbursement is available, although I will provide coffee or tea.

Risk of harm
No risk of harm is envisaged.

Recording
Would you be comfortable with me recording this conversation? YES / NO _____

Anonymity
This is not an anonymous interview. The intention of this interview to gather your thoughts, impressions, or knowledge of the topic. If I use this interview within my research, you will be properly credited and cited as a reference within my thesis.

Are you comfortable with being referenced in my thesis? YES / NO _____

If I reference you within a section of my thesis, would you like to approve the comment before I publish it?
YES / NO _____

Name:	
Signature:	
Date:	

ADDENDUM 2:

To be completed if you answered YES to Question 2:

It is assumed that you have read the UCT Code for Research involving Human Subjects (available at http://web.uct.ac.za/depts/educate/download/uctcodeforresearchinvolvinghumansubjects.pdf) in order to be able to answer the questions in this addendum.

2.1 Does the research discriminate against participation by individuals, or differentiate between participants, on the grounds of gender, race or ethnic group, age range, religion, income, handicap, illness or any similar classification?	YES	NO
2.2 Does the research require the participation of socially or physically vulnerable people (children, aged, disabled, etc) or legally restricted groups?	YES	NO
2.3 Will you not be able to secure the informed consent of all participants in the research? (In the case of children, will you not be able to obtain the consent of their guardians or parents?)	YES	NO
2.4 Will any confidential data be collected or will identifiable records of individuals be kept?	YES	NO
2.5 In reporting on this research is there any possibility that you will not be able to keep the identities of the individuals involved anonymous?	YES	NO
2.6 Are there any foreseeable risks of physical, psychological or social harm to participants that might occur in the course of the research?	YES	NO
2.7 Does the research include making payments or giving gifts to any participants?	YES	NO

If you have answered YES to any of these questions, please describe below how you plan to address these issues:

As a preliminary investigation, I will be interviewing between 2 and 6 experts in the field to gain focus and direction for my research.

They will participate in the research voluntarily, with full knowledge of what this entails, as detailed in the Consent Form (attached).

They will be identified as a source within my paper and its reference list in the same way that I would identify a particular book, academic paper or journal that I referenced during the course of my research.

The nature of these interviews will be very preliminary to the main, document-based, investigation. In the event that the interviewee does appear as a source for an in-text quote or comment, the section will be sent to them for approval.

ADDENDUM 3:

To be completed if you answered YES to Question 3: NOT RELEVANT. DID NOT ANSWER YES.

3.1 Is the community expected to make decisions for, during or based on the research?	YES	NO
3.2 At the end of the research will any economic or social process be terminated or left unsupported, or equipment or facilities used in the research be recovered from the participants or community?	YES	NO
3.3 Will any service be provided at a level below the generally accepted standards?	YES	NO

If you have answered YES to any of these questions, please describe below how you plan to address these issues:

ADDENDUM 4:

To be completed if you answered YES to Question 4

4.1 Is there any existing or potential conflict of interest between a research sponsor, academic supervisor, other researchers or participants?	YES	NO
4.2 Will information that reveals the identity of participants be supplied to a research sponsor, other than with the permission of the individuals?	YES	NO
4.3 Does the proposed research potentially conflict with the research of any other individual or group within the University?	YES	NO

If you have answered YES to any of these questions, please describe below how you plan to address these issues: